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TRANSACTIONS

OF THE

Illinois State Dental Society

AT THE

Thirty-Third Annual Meeting,

HELD AT

PEORIA, MAY 11 TO 14, 1897.

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Addresses, Essays and Discussions.

PRESIDENT'S ANNUAL ADDRESS.

By C. R. Taylor, D. D. S., Streator, Ill.

Members of the Illinois State Dental Society: With a growing desire for greater intellectual achievements and for higher attainments in our profession and believing that knowledge is the supreme test of desire, that reason is the power behind the throne of wisdom, that usefulness is the greatest and best aim of life, we have met to seek for knowledge and to reason together, with the hope of finding that wisdom which will lead us into the scientific nature of things so that, individually, we may be of the greatest helpfulness to suffering humanity in the daily application of our professional life.

Self-preservation is said to be the first great law of nature, but a greater law stands forth and says, "No preservation without progress." So the greatest law of the universe is the law of progression.

Unseen hands are constantly changing star dust into revolving planets; having within them the potentialities of all the myriad forms of life. The earth upon which we live has been evolved from the nebulous mass which contained within it all the possibilities of life which have since found expression on this globe.

The first cell or cells of organized life had in them all the potentialities of life that lie between the monad and man. That divine influence which has wrought life from the lowest living matter up to man, is still working and whether in the future there is to be developed on this earth a superior order of life form than man, only the ages can tell. There is no question that humanity as a whole, the world over, is being moved to a higher intellectual and moral height than the history of man has ever shown. Things are being done to-day under known laws more wonderful, from an in-

tellectual standpoint, than was ever done when the gods and men walked, talked and worked together in myths and miracles.

That old Shakespearean couplet that says

> "There is a divinity that shapes our ends
> Rough hew them as we may,"

is scientifically true. The evolution of man from the savage or primitive man to the civilized being has been accomplished by advancing and retreating, now up, now down, and at his best man's advance has been "spiral" rather than direct. Often without any thought of his own intellectual possibilities and future, and in spite of his ignorance, the invisible hands of destiny have pushed him forward and upward, until the prophecy is now going forth that man in the future will be a six-sense being.

Now the highest and holiest duty of man is to know himself; not simply his physical form and mental characteristics, but his higher, ethical and spiritual nature.

All organized social life must be based and planned upon the theory of self-preservation and progression or it must eventually fail because of the lack of such potential power. Any special society, for whatever purpose it may have been organized, must have this potentiality of existence as proof of its right to live.

Societies, like men, can only grow by looking forward. They cannot live upon the past alone, but must find sustenance in the present and have a growing desire for greater and better things in and for the future. And that brings us to the question of, "Where are we at?" Do the eyes of this society see only the verdant fields of the past? Or do they take in with increased vision the greener hills and valleys of the present and behold with joy and confidence the emerald sheen of the future? When this society was organized, thirty-two years ago, education and professional life in dentistry was at a low state of culture, but a few large-minded progressive individual cells saw the need of progress and self-preservation of our profession and made an organization, called the Illinois State Dental Society, which has shown its great possibilities, by its constant growth and vigor.

It has been able to renew itself by the absorption of suitable pabulum and the ability to change its form under varying conditions. So long as the cell life was young and active the general organism thrived and grew. New life and vigor were constantly manifesting themselves in a bloom of youth and progress.

But there are evidences that this society, which, for so many years has marched as the vanguard in professional society work shows signs of indifference or incapacity to much longer lead in the march of progress. What are the evidences of this weakness? They may be briefly stated. When this society was first founded, it not only grew in a healthy way, in numbers and enthusiasm, but the papers showed a growing spirit of original and individual investigation which has seemed not to grow in proportion with the increased experience and enlarged membership.

Not only may that be said but in its earlier existence this society had a larger growth of membership when compared with the number of practitioners in the State, than it has been gaining in these later years. This society was formed July 24, 1865, with a membership of forty-nine. There were about 400 dentists at that time practicing in the State. One hundred and twenty-five members joined the society during the next ten years. There are now 166 active members belonging to this society living in this State. During the past ten years 160 have joined the society, while there are now not less than 1,900 to 2,000 persons practicing dentistry in this State.

It is possible that the chief cause of this pessimism comes from the mercenary tendency of our professional life, in that not only the fierce law of competition is seizing the vitals of individual life, but in so doing it is destroying the energy and growth of this grand organization.

Shall this *Zeitgeist* prevail?

All organized life is dependent upon at least two conditions. First, that it can reproduce itself, and second, that it can adapt itself to the changed conditions or environments of its life. That is a universal law embracing life and society.

In the early days of this society, dental colleges and journals were few in number and less patronized than they are now. It would seem as though both of these institutions should be influences in the building up of societies such as our State and local societies are, and that the readers of the dental magazines in this State would be almost unanimously members of this society. Yet it is possible that the very fact of nine-tenths of the reading matter in our journals being papers prepared for and read in the State and local societies and then printed in the journals, and thus practically given to the profession, is one of the reasons why our

society has not the membership it would otherwise have. Because the profession at large find it cheaper to buy the journals than to attend society meetings. The average proficiency of the members of this society in the practice of dentistry, in ethics, culture and good fellowship, is superior to that of the average dentist in the State outside of this society, and that superiority is largely the result of the work done by this organization; therefore the conclusion must be reached that there is need, and a growing one, of some method by which the large number of the profession outside of this society can be reached and inspired with greater desires for a nobler, higher and better professional life than they now possess. So, then, this society must show its right to live, by its ability to change its mode of life to suit its present necessities and environments.

The preamble to our constitution says the aim and object of this society is "the promotion of the honor, usefulness and interest of the dental profession and mutual fellowship and good feeling." Those are noble ideas, but how many of us really put those ideas into actual *everyday* practice? Of course we all believe in them, once a year, when we come to our annual meeting.

Suppose we, every one of us, should all the year carry those ideas into practice. Is it not to be hoped, if that were done, that instead of there being an actual gain of five members to this society per annum during the past five years, that we could expect a majority of all the dentists in the State would be constant and faithful members of this society? It is the duty of each of us to constantly work with our dental brothers in our own and surrounding communities for the purpose of showing the mutual fellowship and good feeling that comes to those who meet here in a social and scientific spirit. Can this society—as such—do anything to change the undesirable condition among the profession at large? It can and must adapt itself to its changed surroundings if it would really fulfill its mission. It can, because a few years ago it not only changed its constitution and by-laws and mode of work, but it put into existence four other dental societies in the State which have been giving back to the parent stem new life and renewed vigor by getting a part of their members to join the mother society. It may not be practicable, for this society to organize more societies, but it should be its mission to so fill the heart and spirit of its individual members with such a love for its

prosperity and growth and for the professional salvation of those outside of its fold that they will work incessantly to reclaim the quacks and save those who are dying of inanition and dry rot. How must this be done? Just as it is done in any organism. The change in all organized life must first manifest itself in its primary structural elements, or cell life. So in all growth or changes in organized societies. The individual must do for the society what the cell does for the organism. Commence the development of the potentialities of its being. This individual work can be done by each member of this society helping to organize fellowship clubs in communities having three or more dental practitioners, and when there are less than that number in a community the dentists in several towns could unite for mutual improvement and benefit in all worthy ways and the ultimate result would be reunion in our State society. Each of us should solemnly pledge himself to do this work; if that is done and the pledge faithfully redeemed there can be no question as to the results.

At our last meeting there was a tendency manifested to hold the colleges largely responsible for the lack of professional rectitude and the nonprogressiveness of the graduates from such institutions. While the colleges should be held strictly to account in their duty and responsibility in this regard, yet no thoughtful person can but conclude that there are others who are also responsible. The profession as a whole, individually and collectively, are most responsible for the quackery and unprofessional conduct of the young men just commencing professional life. As a profession we are too mercenary and in consequence too selfish.

Too many of us, when we have established ourselves in a community, in some way get the idea that the community belongs to us by right of discovery or conquest and that we are monarch of all we survey by divine right. The result is, when another enters our (?) territory, especially if he is a young graduate, he is treated as an interloper—an enemy—and made to feel that he has no rights that we need to respect.

Being a young man with little money and few friends, he feels compelled by force of circumstances and necessity to get something to do, and that something, very quickly too. The result is, he starts on the road to quackery and unprofessional conduct in general. Yet when he left college he had promised himself to be a true professional man and he might have succeeded in so doing

had the older practitioner received him as a younger brother and welcomed him as one having the same rights that he had in that community. Such an illiberal spirit is not only narrow and selfish but it is as truly unprofessional and unethical as is the more gross form of quackery.

It is possible that original research and individual investigation into unsolved problems pertaining to our profession could be stimulated by this society giving a special diploma, prize or medal of honor for worthy inventions and original scientific discoveries. This society could do itself no greater honor and the profession no greater service, besides doing a most graceful act, than by bestowing upon Dr. Black a medal of honor for the great benefits he has rendered to our profession by his untiring zeal in original investigation.

Could not our colleges afford to lay aside a portion of their gains each year, for the purpose of organizing and sustaining a class of investigators led by such a man as Prof. Black? It must be possible that some method can be adopted whereby the young men coming out of our institutions of learning can be reached and trained and directed in original work. For there must be a good deal of latent talent either running to waste or lying dormant that should be aroused and stimulated for some great work. If some such thing could be done, it is reasonable to suppose it would meet with the hearty approval of the profession and generous financial help from individuals.

It is a grand hope and it would be a great gain to professional attainment, if this society could use it influence for the foundation of an organization that would arrange a course of studies after the plan—say—of the University Association, of which Bishop Fallows is at the head, the object of which would be to lay out a course of reading and study that would interest the profession in the pursuit of useful and scientific professional knowledge. That would in fact be a post-graduate course of study. Each member in such an organization could have given him a certificate setting forth the studies taken, or a diploma on passing a satisfactory examination. The information, work and discipline thus gained would be of great benefit to the individual, and would finally reflect honor on the profession and this society. Self culture is neglected, largely because individuals do not know

how to arrange a course of study. A plan such as suggested would furnish what is lacking.

Ladies and gentlemen of the Illinois State Dental Society, let us be inspired with the duty of magnifying our calling. May our qualifications and attainments take us away from the reproach of being "tooth carpenters" and "tooth pullers."

Can we not show to the world that our profession is the most progressive, scientific and exact of all the healing professions? And that we are the peers of all the learned professions, in culture and accomplishments? Lecky in his "History of European Morals" pays our profession this high compliment. He says: "It is probable that the American inventor of the first anæsthetic has done more for the real happiness of mankind than all the moral philosophers from Socrates to Mill." That is praise indeed, for that "inventor" is one of our professional immortals.

Let us have the greatest aspiration and ambition, not simply for glory and renown, but to serve our day and generation in all worthy ways, by being faithful and true in our professional services and attainments, no matter how humble our talents may be; for he is great who is always true.

Let us believe with Emerson that

"So nigh is grandeur to our dust,
So near is God to man,
When duty whispers low, thou must,
The youth replies I can!"

But too often the youth who under the force of duty and necessity gains, through self-denial, an education, comes to the conclusion that he knows it all or at least all that is sufficient for him to know to gain a living or still more to stand at or near the head of his profession that *that* is success in life. The idea is too prevalent in all walks of life that success consists and depends upon making money or standing at the head of one's special calling. Such ideas are laudable, but there is a grander and more noble idea of gaining self-possession and enlargement. One ties us to selfishness, the other lifts us up to the highest ideals and gives us not only self-conquest but the universe to possess and enjoy.

The tendency of a specialty is to narrow the views and thoughts of him who practices it, making the person an intense, pointed individual, having no broad and comprehensive ideas of life's mission.

One so often fails in the successful treatment of special cases through lack of a comprehensive view of causes and effects. The relationship and close contact of a dentist with his patients is so near that the dental practitioner owes it not alone to himself, but to his patrons, to be not only a gentleman, but the cleanest and one of the most learned and widely informed and cultured men in the community in which he may live. And there is no reason why the dentist cannot be such a man for his hours in the office are or should be few, so he has time for self-improvement, and all he needs is the inclination and capacity to be what his position demands of him. The ideal dentist is a person who has the head of a scientist, the nerve of a surgeon, the heart of a mother and the touch of an angel.

It is pleasing to note the general tendency of the profession toward the conservation of badly diseased teeth. This tendency is no doubt largely due to the advancement made in crown and bridge work and the more thorough and perfect methods of treatment, but there has been a steady and continuous moral growth to that end for a number of years. At the present time that growth is fostered by the dental colleges, and yet the dental profession and the colleges must take a more decided and advanced position on that subject than they have or are now doing.

There is no specialty in medicine or surgery where the practitioners or colleges of that specialty are so reckless in the destruction of the organs they are supposed to save as we find them in our profession. Would any eye and ear infirmary in the world dare to advertise the removal of eyes and ears free of charge, or at any price, that could and ought to be saved, just because they were badly diseased? Yet it is doubtful if the most advanced dental college is free from the charge of allowing and permitting the free extraction of teeth that could and ought to be saved, by students under the direction of a demonstrator, at the behest of patients. The same charges can be maintained against the profession in general. It is to be hoped that the time is not far distant when such practice will not be permitted either morally or legally. May this meeting, which rounds out a third of a century of society work, be noted for its spirit of freedom, fraternity and faithfulness.

DISCUSSION.

Dr. C. N. JOHNSON, Chicago: I have been greatly interested in the president's address. It contains many suggestions. One of the

points mentioned was as to whether the publication of the proceedings in the dental journals was not a drawback to the membership of the society. Possibly the fact that the proceedings are published in the dental journals may keep some men away from the society; but the aim of all our deliberations here is not for the advancement of the society alone, but for the greatest good to the greatest number, and my impression is that the greatest good is done by the publication of these proceedings as widely as possible. There may be many men in the profession, in the State and outside of it, who read the proceedings of this society as they appear in the dental journals, but who possibly could not, on account of circumstances, be present at the meetings. I should not like to deprive those men of this privilege. I am therefore in favor of having the proceedings published and widely disseminated.

As to the question of additional membership in the society, I believe that matter will be brought up more pointedly in the paper of Dr. Allen, at which time we can discuss it.

With regard to the formation of fellowship clubs, I favor it heartily. As the president has said, it would be a stimulus to the members of these clubs and induce them to develop the society spirit. The man who becomes identified with a dental society meets members of the profession, gets the society spirit, and is not quite comfortable afterward unless he is a member of societies; and if he belongs to any society he ought to be a member of the State society. We have had a practical demonstration of these fellowship clubs in the formation of the one at Streator, and from present indications it is productive of a great deal of benefit. I commend the organization of such clubs at different points in the State. As to the selfishness among practitioners in these towns, I had a practical illustration within the last week of how perfect the unity of feeling may exist between members of the same profession in the same town.

I attended a meeting of the Kansas State Dental Association a week ago. I had heard a great deal of Kansas which was not to its credit. Of course, you know it is considered the home of the populist. I went there and I must say that some of the best men that ever breathed the free air of the United States are there, and those I talked with are as much ashamed of the populist sentiment as you and I are. I want to say, furthermore, that I have never met a body of men who were so uniformly in sympathy with each

other, and under every circumstance extended the right hand of fellowship to each other as they did; and the thing that impressed me most was to see two or three men from the same town congregating and speaking highly of their fellow practitioners. I did not hear one word of envy expressed. I noticed particularly that if one of the members from a certain town read a paper, the other man in the town showed his appreciation of it. The dentists I met at this society were educated men and as broad in their knowledge as any men I have met in the profession anywhere. I was proud of my profession when I met with this association. The point I started to make was, that even among the dentists in small towns there was harmony of feeling and a lack of envy and narrow mindedness. It was an object lesson. I have met with a great many dentists, but I never met a State society but what at some time or other showed personal jealousy among practitioners in the same town, and it always managed to crop out somewhere. I trust that the formation of fellowship clubs will do away with this feeling. I think that if practitioners come in contact with each other in society work and become better acquainted their respect for each other will be greater.

As to the suggestion of the presentation of a medal or diploma for original investigation, it is a new idea to me, but one worthy of consideration by this society. The young men who are growing up in our profession do not seem to manifest the same tendency toward original investigation that some of the old members do who will soon pass away, and if any method can be devised whereby we can stimulate original investigations it would be a good thing for the State society to do so. It might be well to have a committee appointed to consider this matter. I have no doubt but what some plan can be brought about to encourage our young men to do original work, and it would be a worthy accomplishment.

Dr. D. E. Coulson, Galesburg: I desire to express my appreciation of the president's address. I think we would all do well if we would try to be governed in our daily life by the spirit that was brought out and emphasized in the paper. Dr. Taylor spoke of a tendency toward retrogression in our society, and I think we might perhaps do well to draw a lesson from history with reference to organizations, social and otherwise. The tendency in past ages, when reform seemed to be required, was to destroy the existing

organization and to build from its foundation. In this destruction of the organization that had previously existed many good features were always lost and it required some time to regain them in the new. I think that our present rapid advancement along scientific and social lines largely grows out of the continuity of organization. We are indulging in the process of evolving or throwing off the bad and holding on to the good. This should be our effort and aim in the State organization. We are imperfect as individuals, and consequently we should expect our organization to present the same characteristics; but it is by individual effort, as has been suggested by the president, that we may hope to secure the ideal in our society. As one of the younger members of the society I hope in the future to be able to put in practice in my daily life and conduct with my professional brethren more of this spirit of courtesy, more of this spirit of helpfulness, more of this spirit of lending a hand.

In regard to the colleges and their influence upon the young men. I have talked with quite a number of young men who have recently graduated, and although not saying it directly in so many words, their early association in a college and during their college life was of such a character as not to direct them in the lines that they should follow afterward; but the expression they gave was a lack of honesty in carrying out the spirit of the law. We cannot put in words the spirit of ethics. It can only be expressed in the living organism, and I think our colleges are appreciating this fact and seeking to improve along these lines, and I for one feel like offering encouragement to them rather than to manifest a spirit of criticism. I trust, therefore, that in the future the society will have no complaint to offer againt them.

Dr. Arthur G. Smith, Peoria: There seems to be so much talk of the young men of the Society, hence I cannot refrain from making a few remarks. I do not think we are as black as we are painted. We would like to do right if we could, most of us, and I am pleased to state that Peoria is my native city, and among the dentists in this city there is the broadest spirit of courtesy and liberality manifested. I think, without exception, the young men of this town are endeavoring to the best of their ability to refrain from any questionable practices whatever. A young man came here a year ago and tried to make a start. He conducted himself as courteously and gentlemanly as any one possibly could, but for

some reason he was unable to succeed, and rather than resort to questionable practices or to deviate the breadth of a hair from ethical grounds, he discontinued his practice. Nothing could be better than this. The man practically lays down his professional life for what he considers to be the proper thing. In our societies and colleges a young man's professional position is determined largely by the individuality within him. I do not think we can educate a man who simply wants to make a tooth puller out of himself. There is no use in wasting time on him. He will go as my father said to me when I asked him for advice—"go to h— your own way." I think a man is apt to do that himself anyway, if he is not particularly careful. So in regard to the society. The societies are a continuation, so to speak, of the colleges. We are almost bound to get into a rut unless we become members of a society. We read reports, but nonmembers do not receive the benefit that those do, who come to these meetings and listen to the most eminent men, who have given time, study, and attention to the particular subject in hand—men who have spent weeks and oftentimes years in their investigations and give us the mature fruit of them. I do not think we do our profession justice if we are not members of this society.

With reference to membership in this society, speaking for myself, I was willing and ready to join this society, but might have gone on until to-day as nobody invited me to become a member until I met Dr. Taylor, who asked whether I was a member of the State society or not. I replied "No." He said, "It is the best thing you can do, and I would advise you to become a member as soon as possible." I thought I was not good enough to join; that I was too small and insignificant, but I got in here and I do not feel very much out of place. (Laughter.) I shall do my utmost to secure as many of the younger men as possible to join this society.

Dr. T. F. Henry, Streator: We have formed, as our worthy president has said, a professional fellowship club in Streator, and up to within the last month five dentists joined it. Another young man has signified his intention to join. I do not think there is any town in the State that ought to feel more flattered on account of being so well represented as Streator, and this comes through the energy of Dr. Taylor. He spoke to us regarding the benefits of the society, and we were in perfect harmony with him, we thought that if every one would put his shoulder to the wheel and lend a

helping hand to every young man that came to our town and began to practice, it would be a great deal better, and the profession would profit by it. Because we are in town and have been located there for some time, as the president has said, we are not "monarchs of all we survey." If that feeling was manifested toward us we would have to go somewhere else and commence to advertise. I found a helping hand, when I began to practice in Streator, in Dr. Taylor. He welcomed me as he did other dentists. Every dentist that came there we helped along. We had two young men who did not do very well. They saw that the town was overcrowded with dentists and they started to advertise. We talked to these young men and asked them if they would not kindly desist from resorting to such methods.

We extended the right hand of fellowship to them and tried to lead them in the right direction. We asked them to stop advertising and to become members of our societies. The result was that they discontinued advertising and are now getting along nicely. Personally, I feel that there is not a town in the State of Illinois in which there exists more harmony than in Streator. We never pass each other on the street without shaking hands and talking to each other if we have time, and usually about matters pertaining to the profession. I have a warm place in my heart for Dr. Taylor and the rest of the profession, and I believe if everybody in the profession would do as well we would have a much larger membership than we have at present. This can only be done by each one of us helping the other.

Dr. S. Finley Duncan, Joliet: I think Streator is one of the most resourceful places I ever heard of, and I am glad to know that these young men came in, in the manner spoken of. It is said that one or two young men went to a certain town and did not conduct themselves in a professional way. In other words, they were advertising. One of the older members of the profession said to them, "You must stop that thing or we will put a man close by you to do work for nothing, and then you will have to quit."

Dr. Louis Ottofy, Chicago: I wish to refer to one phase of the president's address, and more especially to the remarks made on that phase by Dr. Johnson, because I shall have something more to say in reference to the matters discussed, when Dr. Allen reads his paper. The question is sometimes raised in regard to the publication of the transactions, it being claimed that a non-

member, who is a subscriber to a dental journal, will get the reports of the meeting and read them, while the man who is a member of the society has to wait for his volume of transactions several months; consequently the nonmember is supposed to have the benefit of reading the papers and discussions, while the member who unfortunately was not at the meeting and is not a subscriber to the journal in which the transactions appear, does not have the benefit. I have no doubt that a number of men are kept from joining the society in that way. On the other hand, there is no dental society in the United States whose papers are so broadly circulated as the papers read before this society. I have seen the papers read here copied from the *Dental Review* into dental journals in England, translated into French, Spanish, Italian, Dutch, Swedish, Norwegian, Russian and Japanese. You may know from this that the value of our papers is appreciated, and that they go abroad to a considerable extent. I think it is the best thing for the society to give the papers as wide a circulation as possible through the medium of dental journals, rather than to have them bound into a volume, put away on library shelves or locked up, only to be referred to on rare occasions.

Dr. Edmund Noyes, Chicago: It seems to me, there can be no possible question in regard to the publication of the transactions freely. If we were to show any exclusiveness of that sort we would put ourselves as a society immediately back on a level with the traditional old practitioners who were unwilling to take their fellow practitioners or students into their laboratories to show them how they did their work. This is no day and age in which to curtail the circulation of anything that is given in a professional way, no matter what the effect or reaction against our society may be. We should be wholly unselfish as to the effect upon our society. The transactions of everything we do here of value to the profession should be given as wide a circulation as possible for professional purposes.

I wish to say a word or two about fellowship clubs. It seems to me, it is impossible to exaggerate the value and importance of them. There is not a man practicing dentistry who does not to some extent read dental journals and obtain some information in a professional way. There is no place where there are two, three, half a dozen, or twenty men accessible to each other, who would not be benefited by doing this work in social fellowship. It is un-

necessary that they should undertake to do something great or original. Let them come together and talk about the professional things which they have been reading and doing. Two things will come out of it—a broader and more definite professional knowledge, practice and experience, and a far greater propensity to adopt and put into use the new things that they learn and read about than if they simply read about them. If two men talk about a new thing proposed in some journal article, both of them are more likely to do it than those who read about it and do not talk about it. This is one of the advantages of society meetings as compared with the reading of dental journals. Men are stirred up to do the things they hear about. The other object to be gained is personal knowledge, acquaintance and fellowship, which makes us friends, instead of jealous, isolated, selfish practitioners.

Dr. A. W. HARLAN, Chicago: The president wrote me two or three weeks ago and told me something of the character of his address, and in taking it up, not consecutively, I would like to refer briefly to three or four points that are self-explanatory. He said in the early history of this organization there seemed to have been a greater avidity to read papers and present them—greater enthusiasm in fact. That can very easily be accounted for, because at that time there were no other societies in the State for men to read papers before, and now we have more than twenty societies in the State of Illinois, consequently there is a division of forces, not a division of strength in the papers, because we have just as good papers read before the society now, and better papers than we did in the beginning. We have larger audiences. These audiences have been made by this society. And it does not matter if we only have 160 members, the influence of the society has been so great, so continuous, it has been such a powerful force, that it has accomplished the organization of numerous societies in Chicago and Cook County, as well as elsewhere in the State. It has been the incentive which has led to the development of two dental journals. It has been the force and moving power that has created educational institutions in the State, and it has brought about legislative enactment and the organization of the profession into a body. Can you say that its influence is growing less? It seems to me, it is now in a position, with these better educated, better equipped men, to grow slowly and still further extend its influence.

The president said that there ought to be more original work. Well, perhaps there should be. One of the things, I should say, would be that we had better understand the things that have already been accomplished, encompass them and take them in and thereby educate ourselves, so that some one of our number, or a few of our number, can go further and do original work. I do not consider the function of the State Dental Society at present to be strictly of a missionary character. What we do now is to keep up the organization and to take in the men and women who are practicing dentistry as they desire to come in, and extend its influence into the organizing of societies in other communities, so that the knowledge we have gained will be disseminated, and if a man or woman does not feel that it is to his or her interest to belong to this society, he must content himself to exert his influence where he lives and thereby benefit the public in that way.

Dr. C. B. Rohland, Alton: I do not quite understand the exact scope of some points in the president's address. I would like to ask the apostle of this new idea what he would do in a case of this kind. We have away down in the southern part of our State a practitioner who, in a recent trades procession, had some one mounted on a mule, with a placard announcing that the rider was billed for Dr. ———'s office to have his teeth extracted without pain by the use of odontunder. Is that a legitimate field for the application of this good fellowship idea?

Dr. G. A. McMillen, Alton: I would like to say a word or two on the president's address, and in doing so I realize that I am treading upon tender ground. I realize that the position I am taking here is perhaps questionable. I would like to read from this program, if you please, a brief extract. (Here Dr. McMillen read an extract from the program relative to excluding nonmembers from the clinics). Mr. President, this society to my mind, like all other dental societies, is or ought to be a missionary society. I do not believe in excluding any reputable man. I believe that we ought to extend the hand of fellowship instead of shutting such men out. It is the way to build up the society. I have three gentlemen in my mind who are here; two came before the State Board of Examiners; they are practicing in the State now, and they want a permanent license to practice in this State. One of them is from my own town, who is not a member of this society. I said to him this morning, "Are you going to stay until the clinics are over?"

"No, we can't go to the clinics." I replied, "You stay and I will see that you do go to the clinics." I do not think the spirit of excluding certain nonmembers is right. I think by permitting nonmembers to attend the clinics we now and then secure a new member. I am sure that I would have secured two members for this society if they had heen allowed to attend the clinics. Had I not spoken to one of them to remain he would have gone home today, and we would not have enrolled him as a member of the society. I say this with all due respect to the committee. It is a wrong spirit. I want to add a word regarding Dr. Rohland's story. I know the gentleman he speaks of, and the only addition I have to make is that he rode a *white* mule.

Dr. GARRETT NEWKIRK, Chicago: The gentlemen who have preceded me have spoken so well and the remarks made have been so appropriate, that there is very little more to say. I agree with the president almost *in toto*. Dr. Noyes said it was impossible to estimate the value which may accrue not only to dentists in towns and cities who associated themselves together upon the order of this fellowship club in Streator, but to the profession at large and to the State society. I certainly agree with him. It seems remarkable that Streator should have been the initiative point of two movements. Fifteen or sixteen years ago there were five or six of us who met in Streator and organized there the first local dental society in the State outside of Chicago, which we named the Central Illinois Dental Society. It is now the First District Society. From this very small beginning, there grew a membership of fifty in a few years. By this movement was also set on foot to organize the northern, eastern and southern portions of the State, the central and western being consolidated, making four large, active bodies of professional men, who have done themselves a vast amount of good, and have been indirectly a great blessing to this society. There is no estimating the amount of good that can be done in this way; and I have always insisted that the major amount of profit was in the friendship, the good will, the professional spirit that is engendered, even more than in the scientific knowledge gained or applied. The professional, brotherly feeling, the kindness, charity, the mutual understanding and all that, is worth a thousand fold more than it costs. Men oftentimes dislike because they do not know one another. We never like a man thoroughly until we understand him and know his good points. Sometimes there is a

shell of prejudice seemingly all around and over somebody because he is not really understood. This reminds me of an anecdote, I will say of Smith, Brown and Jones. Smith said to Brown, "I hate Jones." But Brown says, "You do not know Jones." "I know it," he replied, "that is the reason I hate him." This illustrates human nature.

I agree with Dr. Noyes as to the value of the publication of our society proceedings. There is no telling how much good they have done in their dissemination the world over. We cannot estimate the value of the matter that has gone into print of the proceedings of this society from the day of its first publication until the present time.

There was one thing in the president's address with which I hardly agree. There seemed to be a note of discouragement in the beginning, a certain intimation that the society had retrograded. I do not believe that. The reason this society looks smaller than it used to is this: There are so many other societies. It is no longer the only society. There are four local societies in Chicago alone, and as many more in the State. Occasionally we have clinics in the city which call dentists from all over the United States. We have big things in Chicago in the way of dental meetings, so that the State society no longer stands alone. I believe on the whole the society has progressed and is progressing and is for that reason to be encouraged. There is manifestly a more encouraging outlook to-day, in that we have heard about the young men who are showing a disposition to coöperate in different localities.

Dr. Geo. H. Cushing, Chicago: I do not wish to consume much time in the discussion of the president's address. It has already been very ably discussed, and I can only say that I agree fully with all that has been said. But I want to call attention briefly to what Dr. McMillen said and ask Dr. Ottofy if he can give us some justification for the action of the council in regard to that matter. Dr. Ottofy is familiar with the grounds upon which that action was taken.

Dr. Louis Ottofy, Chicago: In reply to what Dr. McMillen said, the rule referred to originated in this manner: It has been the custom of a number of gentlemen to attend this society year after year; gentlemen who are practitioners in the State, but not members. They attend the meetings and clinics regularly. I

know this, for the reason that I have signed their railroad certificates repeatedly. After I ran across a name for several years I would ask the gentleman why he did not join the society, and he replied that he would join next time. These men have come to our meetings for the purpose principally of attending the clinics, and in this way they have crowded out some of the members. The aim of the council was simply to either get rid of that class of men, or to give them a gentle hint that they ought to join the society and help to bear some of its burdens, as well as to enjoy its privileges. I would add that the action did not originate with the council, but was the result of a formal, written request of a number of active members, who were prevented from seeing the clinics.

Dr. J. G. Reid, Chicago: While I agree in a measure with what Dr. McMillen has said in reference to the item that appears on the program, I believe it is a most excellent thing. We know that a ship has to be freed of its barnacles occasionally, otherwise it would sink. And this little item in the program is going to free us from a few barnacles that have been accumulating on our ship for ten years to my knowledge. These men have done us no good. They come here to get all they can, and give nothing in return. If the supervisor of clinics knows that a certain gentleman or gentlemen come here for the purpose of joining the society they will be admitted to the clinics without any question. I think this action of the council is a good thing. It will be the means of getting rid of a few barnacles anyway, and personally I want to thank the Executive Council for inserting that paragraph excluding nonmembers from attending the clinics.

Dr. E. H. Allen, Freeport: Before this item of the exclusion of nonmembers from the clinics is discussed any further or any action taken thereon, I want to say I have an item in my paper that applies to the subject, and I would like to have the society wait until they hear my paper.

Dr. J. W. Wassall, Chicago: I wish to say a word or two in commendation of the president's address. It will do us all good, in that it will set us to thinking upon matters that will be of benefit to the society and extend its usefulness.

In the matter of the formation of new societies it is interesting to know that the Odontological Society of Chicago last December decided to organize some local dental societies within a radius of

one hundred miles of Chicago. The society has already organized three societies, one in Milwaukee, one in Elgin and one in Aurora.

I also wish to say that I do not think this subject ought to be passed without taking some action upon the recommendation of the president that a medal be voted to Dr. Black for the work he has accomplished. Furthermore, I think he made the suggestion that a cash prize be given for original investigation, and I would suggest that a committee be appointed to consider the advisability of carrying out the president's suggestions. Prizes need not be awarded unless the work is of sufficient value to warrant it. Considering the size of the society, if the dues were all paid promptly we would have abundant funds to be used by the society for purely scientific purposes. If it is in order I would move that a committee be appointed to take this matter into consideration.

Dr. Grafton Munroe, Springfield: I did not arrive in time to hear all of the president's address, but I was very well pleased with what I did hear, and desire to add my commendation to those of others. Reference has been made to excluding nonmembers from attending the clinics. This matter has appealed to me with double force. As you know, I come from a town where our society meets more frequently than any other town in the State, every alternate year, and by reason of that it has been my misfortune or good fortune, as the case may be, to be put on the local committee of arrangements. I have seen a good deal of the comforts and discomforts of attending clinics, and I have also noticed that on several occasions the members of the society were prevented from seeing the work of clinicians on account of the presence of nonmembers. Even in Springfield there are members of the profession who have said to me, "What is the use of becoming members of the State society, we can see all we want." And I think that clause in our program is an admirable one, and if any suggestions are in order, I would suggest that the supervisor of clinics be instructed to look out for nonmembers and exclude them from the clinics every year, no matter where the society meets. Let them become members of the society before permitting them to enjoy these privileges.

Dr. Taylor (closing the discussion): I think when you get home and have your printed proceedings of this meeting, you will find that some of the uncomplimentary things, or pessimistic views that some of you think are contained in the president's address

are not there; that there is only a thin veil, and behind it you will see the good will, the optimism, that the president always has in his heart for this society and for humanity in general, and whatever may have been considered uncomplimentary was put in the address to irritate or prompt some one to say something, and to emphasize what your president did not care particularly to say. I wish to remark that what I had to say in reference to fellowship clubs did not mean for large cities. People who live in a large city like Chicago do not need these clubs as much as we do in the country. They do not feel the necessity of them. We who live in the country, where there are only five or six dentists perhaps in the town in which we reside, feel it right away when a new dentist comes to town, and yet some of the men who stand the highest in our profession do not always feel so confident when some new man locates in his town or climbs up to the community where the leading men in the city live. This same selfish spirit exists in the city as in the country, and is manifested toward the younger men who attempt to move into the more exclusive communities of city practice or society work. The spirit of what I have said is for city as well as country communities. Fellowship clubs are excellent institutions for small cities. We want to commence at the bottom and reach the top.

Dr. Rohland asked a question. I do not know of a man who needs salvation more than the poor, miserable sort of professional man that rode the donkey or mule to which he referred, and I do not know that any of us should stand so high in professional life that we cannot in some way get down and in touch with that man. I do not believe there is one among us, if we could get the X rays to penetrate our professional ideas of life, but what manifests sometimes an inclination to "ride the donkey," to advertise ourselves to the disadvantage of those who belong to the same profession. What we need is to get into the spirit of this thing, and I do not say that I am more holy than thou. None of us are free from this selfishness, and we should be a little careful in saying that this or that man is much lower than we are. I have in a measure tried to make it pleasant for the young men that came into my town. All the time we say my town, my practice, my home. We are all here not simply to gain a living, not even to live, because the world would go right along if we were all swept out of existence. How few of us realize the loss of the people in

the Paris catastrophe. How little do we think of it. We read it, and that is the end of it. If we get the spirit of brotherly love into our hearts and get at the bottom of these things, these young men feel their wants, and if we can reach them, and I believe we can if we are true to ourselves and our community, we can in a measure do away with the jealousy that now exists among dentists. A little more missionary work should be done by this society, and we should do it by genuine living as members. This is a society that the lower ranks of the profession can look up to as being an organization to which they should belong. We should strive to secure all eligible young men for membership, and we should greet them with open hearts and a friendly spirit. It is my aim to do the best I can for myself and those who come after me; and that is the spirit which should animate us as scientific men, trying to elevate not simply ourselves professionally, but the people with whom we come in contact day by day. (Applause.)

PYORRHŒA ALVEOLARIS.

By J. W. Wassall, M. D., D. D. S., Chicago, Ill.

The statement was made at a recent meeting of the Chicago Dental Society that more human teeth are lost from this malady than from dental caries. The idea to me was a startling one, but a little reflection convinced me of its reasonableness. It might be more true to the facts to say that caries was the arch-enemy of childhood and youth, while pyorrhœa alveolaris was the destroyer after the age of thirty. I have chosen this subject, therefore, because I am impressed with its great importance in dental practice, and because its consideration by this body will not fail to throw some light upon it.

The disease of pyorrhœa alveolaris may be discussed by dividing the subject into the following six general headings, viz.:

1. Definition.
2. Symptomatology.
3. Pathology.
4. Etiology.
5. Treatment.
6. Prophylaxis.

First, definition: The dictionaries of medical and dental science give very inadequate definitions.

Black, American System of Dentistry, Volume I., defines phagedenic pericementitis as a specific, infectious inflammation having its beginnings in the gingivæ and accompanied with destruction of the peridental membranes and alveolar walls. Dr. Black's paper at Quincy in 1882 was the first real attempt at a scientific description of this disorder before this Society. His appellation of the disease given at that time seems more appropriate philologically and scientifically, but common usage has given the term pyorrhœa alveolaris its stamp of greater authority.

Second, symptomatology. There are two classes of symptoms, subjective, or those experienced by the patient and objective, or those obvious to the operator.

The most prominent subjective symptom is pain. Pain may be localized in the alveolar tissue or be reflex in remoter parts of the cranium, face or neck. It will vary in degree from a trifling uneasiness to intense suffering. The tooth, the socket of which is affected, may be elongated or tender to percussion. The patient is frequently but not always conscious of a discharge from the alveolus, having a fœtid odor or taste. The patient will usually give a history of periods of comparative comfort followed by marked exacerbation of all the painful symptoms, but each attack leaving the tooth a trifle more loosened.

The objective symptoms during an acute attack of pyorrhœa alveolaris will be the characteristic signs of inflammation, viz.: heat, redness, pain and swelling. If the disease is of long standing a deficiency of alveolar and of gingival tissue. The existence of so-called "pockets" about the gingival line is pathognomonic and the infallible diagnostic sign of the disorder. The extent and depth of pockets varies from a slight solution of continuity in the peridental tissue to a complete severing of the roots' connection from its socket. Pressure on the gum over a pocket will produce a discharge of pus. The use of the sound or probe will reveal to the educated digit the presence of a deposit of calculus upon the cementum. These symptoms are not always constant, but are present in varying degrees according as a case is in an active or passive stage.

Third, pathology. The nature of the diseased conditions present in the acute and chronic stages of pyorrhœa alveolaris is described under the preceding heading in part and will be more fully considered under etiology.

I desire, however, to refer to a condition described by many writers which has not received a proper interpretation. I refer to the occasional presence of a deposit of calculus on the root having no external communication with a pocket or the gingival margin. The statement is sometimes made that such a condition occurs and that it gives rise to an acute attack with all the usual symptoms except the presence of a connecting pocket. It seems highly improbable from what is known of the formation of pockets in pyorrhœa alveolaris that this condition could arise *de novo* as described. Is it not more reasonable to attribute the condition to nature's attempt to close up a pocket after the subsidence of an acute attack by which the deep end of the pocket—the bottom of the pocket so to

speak—is left as a cul-de-sac containing its scale of calculus on the roots together with the several varieties of pathogenic bacteria which will ultimately give rise to further outbreaks of the acute attacks? A condition of the gravest consideration under the head of pathology is the wasting of the alveolar process. This is due to the destruction of the peridental membrane which undoubtedly has occurred wherever pockets have formed. The peridental membrane is the alveolo-dental periosteum, being the periosteum of the alveolar wall next to the root as well as the periosteum of the root. Its disappearance would deprive the process at such points of nutrition and would sufficiently account for the wasting of the bony structure.

Fourth, etiology. The cause of pyorrhœa alveolaris is still involved in mystery. While there have been many theories advanced and the best thought of the profession has been given to the subject thus far nothing conclusive has been established. There seem to be advocated, first, that the cause of the disease is purely local; second, that it is constitutional, and third, that it is of local and constitutional origin combined.

The argument so often advanced that the disease must be purely local because local treatment will result in its disappearance would at first glance seem to be conclusive. But a closer examination of this claim shows its fallacy. For by the same reasoning eczema, the local manifestions of which are removed by topical treatment could be called a local affection when its constitutional origin is a well-known fact.

A more satisfactory cause to my mind is proposed by Drs. Peirce and Kirk, viz., the uric acid theory, but the value of their claims is still speculative. While I do not deny that their claim may be correct, I am not prepared to accept their proposition that the deposits of pyorrhœa alveolaris are equivalent or analogous to the calcareous deposits of the uric acid diathesis. Dr. Black has demonstrated by his analyses that uric acid may be present in all deposits upon the teeth, salivary or serumal, irrespective of the fact of the presence of pyorrhœa alveolaris. If the serumal deposits of pyorrhœa alveolaris were identical with the calcareous deposits in the joints of gouty or rheumatic subjects why is it that the deposits on the roots of teeth never occur as loose nodules in the peridental membrane? I wish to assert that I am unconvinced that pyorrhœa deposits originate *de novo* unless situated in pock-

ets. The chemical analysis of any calculus taken from an individual of the uric acid diathesis—and the uric acid diathesis is very prevalent—would naturally reveal the presence of uric acid. Would you infer that stone in the bladder and its accompanying irritation was due to gout because analysis yielded uric acid crystals? I have brought before you these few objections to the uric acid theory not because I disbelieve in it entirely but in order to show that the ground upon which its advocates stand is not yet assured.

The causative agency of the calculary deposits in pyorrhœa has always been a matter of doubt. While it is almost unquestioned that a pocket precedes the formation of a deposit, yet it is plain to every observer that the presence of serumal calculus aggravates all the symptoms and accelerates the progress of the disease. Salivary calculus is important as a predisposing cause of pyorrhœa alveolaris, in that it establishes a lesion of the gingivus, a condition favorable to the development of the disease.

I wish to suggest a constitutional disorder which seems in my judgment to bear an important relation to this affection. It is eczema. All observers seem to agree that the scrofulous tendency or dyscrasia is very favorable to the development of pyorrhœa alveolaris. Scrofulous persons are invariable subjects to impairment of the integument or of the tegumentary appendages. It may take one form or another. In one family it will be early failing of the hair bulbs; in another, dryness of the cuticle. All such are tegumentary degenerates, and it is my experience that very few cases of pyorrhœa alveolaris come under my notice in which I cannot find some indication of eczema.

The infectious character of pyorrhœa alveolaris has been noticed by many observers. Dr. Black, in his article before referred to, states it as his belief that the bacteria which are found to abound in the discharge stand in an important causative relation to the disorder. So far as I can learn, no one species has been isolated which will give rise to the disease by inoculating the peridental membranes of the lower animals. There is here open a fruitful field for study and investigation. The disease is in all probability caused by a germ or its toxines, and it is only a question of time when the particular species will be demonstrated.

Fifth, treatment. The constitutional origin of pyorrhœa alveolaris is so much involved in mystery at this time that there

is no basis for systemic treatment. So far as I am able to learn, there is also not even an empirical method of systemic treatment of any special value. We are therefore driven to the other alternative and forced to rely on local treatment until such time as further investigation shall have revealed the truth to us.

For the same reason local treatment is carried on in the dark, but we know that in this direction only can we obtain any really satisfactory results.

When a case presents it should be the first duty to make a thorough examination. The gingivus of each tooth should be carefully sounded for pockets and when one is found its location, depth and width should be accurately indicated on the diagnosis chart.

The treatment should consist first, of the removal of calculus; second, medication; third, the securing of rest and protection.

The location and removal of calculus is often one of the most complex and trying operations the dental practitioner is called upon to perform. There is nothing I can add to what has been said upon this question. Each must put forth his best skill and ingenuity to accomplish the end sought. It is perseverance the educated digit and concentration of mind upon the cutting edge of the instrument which should mainly be depended upon.

Cocaine anæsthesia may be used in painful cases.

In some examinations of cementum of teeth affected with pyorrhœa alveolaris reported by Dr. George B. Clement at the World's Columbian Dental Congress he asserts that the superficial lacunæ and canaliculi become solidified by calcific deposit. It therefore becomes a matter of much importance after removing the serumal calculus to also take away this layer of solidified cementum. Indeed it has seemed to me that success in obtaining adhesion of the new growth of pericementum to the cementum is entirely dependent upon the ability to present a freshly exposed surface of normal cementum to the new granulations.

All operations should be accompanied with a free use of a powerful stream of warm water from a small nozzled syringe.

Medication should consist at the first visit of, first, disinfection to remove all traces of bacteria; second, of a vigorous escharotic to destroy pernicious tissue and to act as an alterative and establish a healthy action which is the proper surgical treatment for any ulcerative surface.

To secure rest cusps should be shortened with the corundum, and if there is any loosening some sort of a splint should be adjusted—metallic bands, pure silver or gold preferably, or waxed silk ligatures.

The mouth is such a favorable habitat for the myriads of pathogenic bacteria that it would be eminently desirable if it were possible to seal up the external openings of pyorrhœal pockets. I have not as yet had any experience in such a procedure, but I believe it is feasible, and some effective way should be employed.

Subsequent treatment should be made with the utmost care not to break up any reparative processes which have begun. Failures are often occasioned by careless probing or uncalled for force in injecting medicaments at this stage. Search for deposits overlooked at the first treatment should not be made unless there is positive evidence of their presence by failure of the pockets to close. Disinfectants and stimulants at varying intervals of from one to seven days are indicated until a cure is obtained.

As every patient once afflicted with this disease is subject to a recurrence, *prophylactic* measures become an important consideration. Maintaining a robust general health, vigorous friction with tooth brushes regularly applied at bedtime and on arising—having four brushes in use so that they are not water soaked when employed—and the rubbing continued for three or four minutes, to be followed with a disinfectant mouth wash—the fluid to be retained in the mouth three minutes—are the measures from which I have observed good results. Pyorrhœa subjects should have the mouth examined for pockets every three months.

DISCUSSION.

Dr. A. W. HARLAN, Chicago: This paper of Dr. Wassall deals with a subject that we all have more or less acquaintance with, and I do not expect in opening the discussion to deal with all of the divisions of the subject that he has made. In alluding to the definition, Dr. Wassall states that Wedl had previously described what we know as pyorrhœa alveolaris. He also named it pyorrhœa alveolaris. This book was published about thirty years ago and was translated into English as early as 1872, so that the name pyorrhœa alveolaris had become familiar to a good many English speaking people through reading that translation. Previous to its appearence in English Dr. J. H. P. Brown, of Augusta, Georgia, had described this disease without being acquainted with Wedl's

classification or denomination, and it was pretty well known from that description, although no name was given to it. As early as 1877 the late Dr. Rehwinkel of Chillicothe, Ohio, read a paper before the American Dental Association which was devoted to a consideration of what was termed pyorrhœa alveolaris, and later, as Dr. Wassall has said, Dr. Black described one phase of it, one division of it as phagedenic pericementitis. I think probably even now to a mixed audience the distinction between what is known as pyorrhœa alveolaris and phagedenic pericementitis is not clearly understood. I should say from a somewhat close observation of a large number of cases that we find in connection with loosening of teeth not only a detachment of the peridental membrane and wasting of the alveolar process, but another condition present, the development of pockets. In the first case, we have the loosening of the teeth, the wasting of the alveolar process, and a gradual evulsion of the teeth without any deposit whatever, no deposit being found at any time, the teeth coming out clean and divested of the peridental membrane. In the other phase we find that there are pockets and concomitant with them, or shortly following the development of these pockets we have deposits that have been named serumal or sanguinary deposits. (Ingersoll). Those deposits are granular, or smooth, in sheets or islands, and they may or may not cover the whole side of the root of the tooth as far as the pocket extends along its side. In most of these cases we also have the breaking down of the alveolar process, not symmetrical, but projecting, so that the alveolar process may surround the lingual surface of the tooth and the root, and the alveolar process will be broken down on the labial surface. Now, we have a totally dissimilar condition in that case from the one in which there is a uniform wasting of the socket, with loosening of the tooth and destruction of the peridental membrane.

In all of the cases of that kind that I have ever seen or examined or observed, I have never yet found one where there was a deposit on the side of the root or near the pockets or covering the apex of the root but what there was some method of reaching it from the gingival margin. I have heard speakers say in conventions before now that these nodules or islands have been found without there being any detachment of the gum at the gingival margin. I have never seen one of these cases. I have seen them, however, when the pulp of the tooth had previously been

destroyed, and the root of the tooth had been imperfectly filled, and then I have seen these deposits after the teeth were extracted, but there was no pericemental detachment. If such a condition of things exists whereby a deposit or nodule of calcific matter could be laid on the side of the cementum without any opening leading from the gingival margin, why do we only find such things on one tooth? Why would we not find it on two or three? I cannot answer that question. I do not know. It seems to me that in all of these cases the presence of microörganisms is absolutely necessary, and that we are concerned in the first place with the loosening of teeth and the symmetrical destruction of the alveolar processes with an anærobic microörganism described by Pasteur as early as 1870, I think, and in the formation of deposits on the roots of teeth, in pockets or pouches, that we are concerned with the anærobic and the facultative microörganisms, the anærobic microörganisms being able to subsist and destroy tissues without the absolute presence of oxygen, and the facultative organism working as a pathogenic microörganism that subsists in the presence of or being deprived of oxygen. These minute deposits and granules and sheets, I should say, are probably, without knowing anything more definite, the result of the destruction of the hard tissues surrounding the root and the deposition at that point, because the roots which contain the products of these organisms are not exposed to any of the fluids sufficient to wash them away, and so in these deposits we find there remains the old and broken down facultative and anærobic organisms. This is very clearly shown by some of the work of McFarland in his book on "Pathogenic Bacteria," and it is further shown in the work of Park in the American Text-book of Surgery on the "Deposits on Long and Flat Bones," but always where there is an open sinus or an opening to the external world. By analogy, if the same process causing the destruction of a portion of the periosteum in bones and the destruction of a portion of the bone itself, or a destruction of the nutritive material which is carried to the point which is loaded with inorganic materials, probably we have reason to believe that that may be the method of the deposition of these deposits independently of the uric acid, rheumatic, gouty, or other diatheses.

Dr. Wassall in his paper said that he did not quite wholly subscribe to the theory of Peirce and Kirk with reference to all

of these cases being attributed to the uric acid diathesis. It has been my good fortune to have had under my care a few people who were strict vegetarians, and it is not generally believed that vegetarians are subjects of the uric acid diathesis, but they had loosening of the teeth and so-called or actual pyorrhœa alveolaris. It does not seem to me that the theory of the universal production of nodular deposits on the roots of teeth is wholly accounted for by the theory advanced by Peirce and Kirk, as the whole human race can hardly be said to possess a universally rheumatic or uric acid diathesis. I know we are sailing in deep water when we are talking about the deposition of these islands and granules and nodules on the roots of teeth, but we have them present, and if we can prevent injury to the gingival margin, the gingival attachment to the necks of teeth might perhaps solve that question. But we have an actual loosening of the teeth, and we have to meet that condition of things.

The method of administering medicines internally for the cure of what we term pyorrhœa alveolaris without surgical treatment or removal of the deposits is an absolute failure. The deposits must be removed. The administration of various forms of lithia and lithiates and gaseous waters for the relief of the loosening of teeth, where there are no deposits, does not result in a cure. It has been absolutely necessary to fix these teeth with splints or bands or some method of holding them together by running bars across the ends or wires, or something of that sort, and the application of local remedial agents.

In the consideration of the causes of pyorrhœa alveolaris, in a paper read by Dr. Rhein, of New York, a year and a half ago, he attributes everything practically to malnutrition; but you and I know, and nearly everybody knows that some of the most robust and active and outdoor people have loosening of the teeth. They may have nasal obstructions; they may have diseases of the mucous membrane itself which will cause them to breathe through the mouth. Now, in those cases we have true pyorrhœa alveolaris, that is to say, as distinguished from phagedenic pericementitis, with the destruction of the alveolar process, of the peridental membrane, loosening of the teeth, distortion of the teeth, etc., without any uric acid diathesis or complications. I should say, then, pyorrhœa alveolaris with a half a dozen other names, such as infectious alveolitis (Witzel), and loculosis alveolaris (Farrar),

symptomatic alveolar arthritis (Magitot and Malassez), subscribed to by Gallipe, of Paris, who has paid a great deal of attention to this subject, with all of these various aspects, we have a great variety of complications, all of which need more or less different terms, and so far as I am concerned, I have never been able to follow a cast iron rule in the treatment of these cases.

There are two points in connection with pyorrhœa alveolaris that I would like to emphasize, as spoken of in Dr. Wassall's paper. They are these: One is this, that the teeth must be fixed in their sockets, held as nearly firm as it is possible to hold them, permitting of a minimum movement. The other point is that the deposits on the roots of teeth in pockets and pouches must be removed. When that is done, cleanliness, the frequent use of various agents in the mouth to destroy any infection, and the sufficiently frequent use of systematic medication to the pouches or pockets is all we can do to effect a cure.

With reference to recurrence. It seems to me there are a number of cases that are cured, and they do not recur. This depends entirely on the local cleanliness and care, with a reasonable amount of inspection by the dentist.

Dr. R. N. Lawrance, Lincoln: I have no criticisms whatever to make on Dr. Wassall's paper. He has given us a clear, concise résumé of the outlines of this disease. So far as my experience with the disease is concerned I have had many successes and some failures, but I feel very much encouraged. We know very little about the etiology of this trouble, and there is an extensive field that lies before the young men of our profession along this line.

So far as bacterial conditions are concerned, bacterial pathology is a subject which should stimulate our young men to investigate and to make some experiments, in order that we may come to a conclusion as to the cause of the different varieties of pyorrhœa alveolaris. It is evident to my mind that there are varieties of the disease which produce the same results, a destruction of both hard and soft tissues.

Coming to the treatment, so far as my experience goes it is a surgical disease, and it requires a knowledge of the parts and the skillful use of proper instruments to remove the deposits that may be in the pockets or about the teeth; in other words, we should make a clean surgical wound of the pocket and surroundings, being thoroughly aseptic in our treatment, and invite nature to bring

about the formation of new tissue. Whatever that tissue may be I am not prepared to say. But I know from results which I have seen that such tissue is formed, the teeth grow firm, the surrounding parts become healthy, and the patient is made comfortable. Perfect rest, cleanliness and stimulation of the parts must be maintained, or there will be more or less trouble. The case will require careful looking after.

As to the uric acid diathesis, I have read with a great deal of interest what some of our eastern practitioners have had to say in reference to this matter; and while Dr. Black says that there may be some uric acid deposits in these pockets, I do not think such deposit is the sole cause of pyorrhœa alveolaris. I had one case which, after treatment, I dismissed about a year ago. It was one of the worst cases of rheumatic gout that I have ever seen, where the articulation of the thumb and finger joints was almost destroyed. Under the use of lithia waters the patient has been made comparatively comfortable; having lost no teeth, and having no decayed teeth. This was a case of pyorrhœa alveolaris which extended over the entire mouth, but which involved more particularly the molars. On examination of the case the first time, I found the gums everted and thickened. I could pass a probe almost to the apex of the roots of the molar teeth. I saw the patient the other day, and outside of some ordinary calcific deposits on the lower front teeth, I found no pyorrhœa. I took a fine probe, and passing it around the necks of the teeth I found the pockets closed. To-day there exists simply a dimple in the gums where the pockets were.

With regard to systemic conditions in these cases, I invariably consult the family physician; and I find in females with female troubles, especially where there is leucorrhœa, that unless this condition is controlled we shall fail to cure the pyorrhœa alveolaris. The systemic causes must be overcome, and the dentist must act in conjunction with the family physician. Take a large percentage of the cases where there are several pockets, and by thorough instrumentation and the use of lactic acid to produce adhesive stimulation, being careful to maintain thorough asepsis in your operations from start to finish, you can effect a cure in most of them. One of the essential points in the treatment of pyorrhœa alveolaris, as in any surgical operation, is to be absolutely clean. Your instruments should be kept in a solution of sulpho-naphthol

during the operation, and thorough cleanliness should be maintained by washes after treatment. Take many of the cases that come to us from the country—people who do not care as well for their mouths as those who live in cities. It is my invariable custom to resort to a system of massage; that is, where the gums are swollen and tumefied. After getting through with the surgical part of my work, I pinch these gums as hard as I can to relieve engorgement before making the final applications. Having done this, the pockets can be sealed up by the use of lactic acid. If, on reëxamination of cases treated, I find a pocket not closed, I conclude that there must be some remaining deposits and I proceed to remove them with instruments, or a 5 per cent solution of trichloracetic acid, as suggested by Dr. Harlan, which will act as a solvent in such cases. Having removed the deposits and all dead tissue, soft or hard, close up the cavities and give nature a chance to do the rest of the work.

I followed Dr. Harlan's advice with regard to treatment of recession of the gums with iodide of zinc, and it has surprised me what success I have had. By making vertical and horizontal incisions and cauterizing the gum with iodide of zinc, the V space can be reduced one-half at least.

I do not rely upon lactic acid to remove deposits, but upon Dr. Younger's improved forms of instruments, to be used by me in my clinic before this society in demonstration of his successful treatment of pyorrhœa alveolaris.

Dr. Thomas L. Gilmer, Chicago: I have been very much interested in Dr. Wassall's paper. He has covered practically all the points regarding our knowledge of this disease. I wish to relate in this connection an incident: About twenty-six years ago Dr. Chase, of St. Louis, was the professor of operative dentistry at the Missouri Dental College, where I was attending lectures. At that time this disease was not understood or discussed as scientifically and thoroughly as it now is. It was more frequently spoken of as tumefied gums. Dr. Chase was a homœopath. He told the students that if we would use very small doses of calomel, or, as he called it, mercurius vivus, we would get beneficial results in the treatment of this disease. I afterward used it to some extent and did seem to get benefit from it, but finally discarded it. About a year ago one of my patients, who had pyorrhœa alveolaris, disappeared. Seemingly I could only alleviate the condition in her case

by the ordinary treatment. She is a sort of semi-invalid, and is frequently in the hands of one of the most eminent physicians in Chicago. Two or three months ago she returned. I supposed, unless she had had treatment by some one else that her teeth would be loose or lost, but was surprised to see the condition of her gums when she assured me that she had seen no other dentist. The diseased condition had largely disappeared. There were some serumal deposits, still the gums looked healthy and were hugging up around the teeth closely. I asked her what she had been doing for her teeth, and she replied, nothing, but that her doctor had treated her for some other ailment on very minute doses of calomel. This she had taken for several months. Of course, I do not know that the calomel had anything to do with the cure of her gums. I saw the condition her teeth were in then and the condition they are in now.

Dr. CUSHING: Was this homœopathic calomel or ordinary calomel?

Dr. GILMER: I believe she was receiving one-twentieth of a grain of the calomel treatment daily. Of course, physicians recognize now that three pellets of the twentieth of a grain of calomel is ample to stimulate the liver.

Since so much has been said about the rheumatic diathesis being the cause of pyorrhœa alveolaris, I have watched my patients who have had this disease very closely, and it is the rarest thing for them to acknowledge ever having had rheumatism. On the other hand, I have found that rheumatic patients generally have a good deal of erosion of the teeth, particularly of the occlusal surfaces.

I think Dr. Lawrance is correct in his statement that it requires surgical treatment in order to effect a cure in pyorrhœa alveolaris. If we immobilize the loose teeth and remove all of the deposits, and all of the carious portion of the alveolar border, we are very likely, without any other treatment, excepting perhaps the use of a detergent, to effect a cure. I have in some instances omitted stimulants in the treatment of the disease, relying on surgical procedure and thorough irrigation, and find I get as good results as when I have used stimulants. Surgeons often by curetting the walls of a cyst, stimulate new and healthy tissue and cause a cure. We do the same in the treatment of pyorrhœa. I think small flame shaped burs are very useful in removing deposits.

Dr J. G. Reid, Chicago: I know very little about this subject, and wish simply to relate an incident which Dr. Gilmer has touched upon, and which makes me think that this is one of the most difficult troubles we have to contend with. We listen and think, and it seems to me it is nothing but think, think, think, and when we have gotten through thinking, the case is done with. The case I have to relate is one that has given me more trouble than any case I have ever had. It was similar to the one related by Dr. Gilmer. A man had pyorrhœa alveolaris whose hair was falling out. The teeth were getting loose. He was a young man, comparatively speaking, but he had lost, through my scrupulous care, two or three molars, and he became so debilitated that he had to quit business and put himself under the care of a physician—a homœopathic physician. I saw the gentleman two years later and expected to see him with his teeth missing, but when he came into my office the teeth that were left were in a healthy condition. This was one of the most aggravated cases of pyorrhœa alveolaris that I have ever come in contact with. I asked the patient if he could relate to me the treatment he had undergone. He could not tell anything about it. He said he had faithfully and conscientiously followed the advice of his old homœopathic physician; that the physician kept his pockets full of small pills, which were to be taken as advised. This he had done for two years. When I saw the man's mouth at the end of this time there was absolutely no indication of pyorrhœa in any part of his mouth, and his teeth had not been touched by a dentist in the meantime.

Dr. Cushing: Did you consult the physician regarding the matter?

Dr. Reid: I consulted the physician, but he would not tell me anything about it. He told me I would have to study medicine and find out what he had. I cannot account for the cure of the pyorrhœa in this case. I do not know whether it was the physician or not that brought about this result. The man was reasonably clean about his mouth and took the best care of his teeth he could. It seems to me remarkable that such a condition was brought about in this case. I have no theories to offer as to the etiology of pyorrhœa alveolaris. We find this condition existing in rheumatic and gouty people, and the gouty and rheumatic people who do not have it are just as numerous as those who do have it, and personally I cannot advance any definite opinion as to the cause

of this disease, and I can only say that I do not think we know very much about it at present. Some cases we can and do cure, and there are a great many cases in which we do not effect a cure. I have been tempted oftentimes to experiment a little in some apparently hopeless cases by removing, scraping and replanting them.

Dr. Grafton Munroe, Springfield: In my practice of twelve years I have met with a number of cases of pyorrhœa alveolaris, but I very rarely make any promises to my patients as to what I can do for them. Dr. Wassall has suggested that patients with this disease ought to call on the dentist every three months, and I believe this is one of the keynotes to successful treatment of these cases. I have been discouraged to find that some of my patients did not come back at the end of three months for additional treatment, if necessary. I have found one case that relates especially to this trouble which I desire to recite. A gentleman, who lives in Springfield and conducts a business there, thought he had struck a cure for this trouble, so much so that he wanted me to tell it to other people, and it is along the line of homœopathy. He had traveled all the way from Montreal to California, visited dentist after dentist, and when he asked the dentists whether they could do anything for his trouble; they would shake their head and say the disease was incurable. He found one man that was willing to treat his teeth, and another man in Bozeman, Mont., who had obtained medicine equivalent to Robinson's remedy, which we have often used for this trouble. He persuaded me to send for that remedy. I had used it quite often without any marked results. However I secured it to please him. After some visits to different dentists he came back to me and had me to help him a little. He then told me that he was taking a homœopathic remedy by the name of calcarea renalis internally, and that he had been taking it constantly for some time. Under the use of this remedy and the attention that he received at my office and from other dentists he happened to visit in the country, he improved considerably, and thought that calcarea renalis was such a wonderful remedy that it ought to be proclaimed to the world.

Dr. Garrett Newkirk, Chicago: There are two or three points I wish to touch upon in connection with this subject. We have heard a good deal about the etiology of this disease to-day, and we know not very much more than we did before, although

the paper is an excellent one and presents the facts up to date. A good deal has been said with regard to the removal of the deposits from the roots of teeth. Very well and good, but we must not forget that after the disease has reached a certain stage and there are present large pockets, we have not only to remove deposits from the teeth, but we have to contend with carious bone, real caries of the alveolar process. Dr. Gilmer has touched upon the subject when he spoke of burs for scraping, but I wish to bring it out clearly and emphatically. It is necessary to examine the condition of the alveolar process in these cases, and find out whether or not there are any spiculæ of bone extending into the pockets, because there is often an irregular, ragged condition of these walls. We will find by using a scraper, or a spoon shaped excavator of the large sort, or a bur, with or without the engine hand piece, that the walls will break down easily. We should use a bur or other instrument till we feel that we have got down to the harder tissue of the alveolar process. We must get rid of the loose ragged walls. I have had many cases where, after removing the spiculæ of bone that reached in between the teeth, the walls being thin, a cure has been effected almost spontaneously with very little other treatment.

A few weeks ago, when I started for California, I gave final treatment in a case of this sort that had been obstinate for a year or more. By means of the bur I reached around in between the roots of the two central incisors, found the softened and easily removable pieces of bone, which I thoroughly took out. Then my assistant during my absence made two or three injections, and when I came home the case was absolutely cured. The gums were in a perfectly healthy condition. It is just as important to examine the bone as it is to examine the tooth.

One more point. Where you have a case, for instance, involving the lower incisors and possibly the cuspids with them, and there is, perhaps, a crowded overlapping condition of the teeth, extract the worst one of the lot for drainage, then bring the others together with ligatures. You may effect a cure in this manner often when you cannot do it in any other way. If you have a lower incisor or bicuspid which is just hanging by the end of the root, it is better I believe to have it out of the way, to relieve congestion, secure drainage, give room for treatment, and save the rest of them.

Dr. F. H. McIntosh, Bloomington: I cannot say how intensely interested I am in this subject, and perhaps my method of treatment will help some one, and so I will tell you the method I employ in the treatment of these cases in the way of medicaments. I syringe out the pockets, each of them, with a 3 per cent solution of pyrozone, and following that I use a 10 to 15 per cent solution of aromatic sulphuric acid. I get excellent results from this method. Most of you understand the action of aromatic sulphuric acid. It takes hold and removes dead portions of bone, and does not affect the living.

Dr. J. G. Templeton, Pittsburg: Like some of the other gentlemen who have spoken on this subject, I must confess that I know very little about it. I have been treating cases of pyorrhœa alveolaris since 1867, at a time before Riggs wrote anything on the subject. At that time I could get nothing to read on the subject, except what was in "Taft's Operative Dentistry" and what was written by the older men of the profession. There was a little in Harris' work, but not very much. When Dr. Robbins, of Marysville, found out what I was doing he laughed at me. He said he had been all through this thing and I would have to quit too. I remember saying to him that I did not expect to quit, but that I was going to keep on trying to find something to cure this disease. I asked everybody for information and got nothing. The first I saw was Riggs' work. I did not like it. I had an experience prior to that time not to like what he wrote, when he recommended tincture of myrrh. All I did know was to remove the deposits with such suitable instruments as I could get, and I have in my possession now for removing deposits of tartar, instruments that were made fifty years ago. The man who owned them was killed at the battle of Fredericksburg. I got them from his son and I have used them up to this day. He had been practicing some twenty-five years before he entered the army. As Dr. Reid said, we do not know very much about pyorrhœa alveolaris—at least, I do not, although I have been studying it all this time. I believe I have read almost everything that has been published on the subject, and have received some hints from what Dr. Harlan has written, and some points from what Dr. Peirce has written. I do not place much confidence in the uric acid theory. A few years ago, Dr. Patterson took the ground that pyorrhœa was due largely to catarrh. In a person who has catarrh badly, this trouble is likely to be aggrava-

ted, just as a uric acid diathesis will aggravate it. The best thing in my opinion that has been written on this subject in the way of illustration and description, as has been mentioned here, can be found in the "American System of Dentistry," in the article written by Dr. G. V. Black.

In regard to the treatment of pyorrhœa alveolaris. I have practically gone through the materia medica in search of remedies to cure this disease. I have tried everything that has been recommended, and I always get back to one thing. Dr. Peck will recollect that I treated some cases at the Chicago College of Dental Surgery a few years ago, and I have to say this in regard to these cases, that there is a great deal called pyorrhœa that is not pyorrhœa. Dr. Black makes an accurate distinction between cases when he says that certain cases are nothing more nor less than calcic inflammation.

It is an inflammation of the gums caused by the deposit of tartar around the necks of teeth producing irritation. It is different from genuine pyorrhœa. Pyorrhœa means a flow of pus from the sockets, from the alveolus, and when you see a genuine case of pyorrhœa alveolaris you do not see much deposit. The pus flow is dissolved, it is not oozing out, and there may be some deposits upon the roots of the teeth. It has been said by Dr. Lawrance, and very properly, that we may remove all the deposits. I think that is the first thing we should do. If you use the proper instrument and have an educated touch to your finger, you will know when it comes in contact with any of these deposits. Sometimes it requires considerable force to dislodge them.

A few words more in regard to treatment and I have done. I was invited to read a paper before this society, and have prepared one on practical things in practice. At the time I did not know there was to be a paper read on this subject. I have prepared a few lines in regard to pyorrhœa alveolaris, and I shall be glad to tell you something about it to-morrow when I read the paper. I will simply say that my sheet anchor in the treatment of pyorrhœa alveolaris is sulphate of copper. Dr. McIntosh referred to the use of aromatic sulphuric acid; that comes nearer to my treatment than anything that has been mentioned this afternoon. You all know that where there is necrosis of bone the sulphuric acid treatment is the most reliable, and that you have to depend upon it to arrest necrosis. I applied it heroically in many cases. I

learned to use it at the Pennsylvania Hospital in Philadelphia. While there I saw many cases brought into the clinic presenting large ulcers on the limbs and different parts of the body. These ulcers were indolent and would not heal. We applied a 20 per cent solution of sulphate of copper on a cloth saturated with it, which was laid over the ulcer, and the next time we saw the patient we could see that the ulcer was beginning to heal, that granulations were taking place. At the end of a few weeks the ulcer was entirely healed. After seeing it used in the Pennsylvania Hospital for the treatment of ulcers, I thought of these spongy gums that I had been trying to cure. When I reached home, in the first case that came to my office I thought of this treatment of 20 per cent solution of sulphate of copper. I applied it and had excellent results.

Dr. WASSALL: There is very little for me to say in closing the discussion on my paper. There does not seem to have been any criticism upon it. The discussion, however, has been so instructive and interesting, that I think those of us who heard it have been benefited, and I am glad I selected the subject of pyorrhœa alveolaris for my paper.

OPINIONS OF ILLINOIS DENTISTS REGARDING DENTAL SOCIETIES.

By E. H. Allen, D. D. S., Freeport, Ill.

I find that to arrange the opinions expressed in three hundred and sixty-five letters received in reply to the circular sent out March 1, is a difficult task.

It is of course necessary to arrange the opinions into some kind of order so that some defense can be made against the attacks on this society.

Of the three hundred and sixty-five letters received, I think that six-tenths of the dentists were members of some dental society. About three-tenths were not members and never had been. One-tenth had been members at some time, but were not at present. The greater number of replies thus received were in favor of such organizations, and believed that no particular reform was necessary; on the other hand some of these, while they were members, were not satisfied with the way of conducting dental societies, and suggested several reforms as will be seen hereafter.

I trust that no one will take any offense at anything I may have to say, nor to being quoted; nor will any one here, if quoted consider I have violated any confidence placed in me as I shall in no case divulge the name of any correspondent.

The object I have in view is to discover, if possible, why in this great State of Illinois with nearly two thousand dentists, only one hundred and ninety are active members of this society, and out of this number only ninety-six were present at the last meeting held at Springfield, 1896.

It will be remembered that two years ago, I began the work of correspondence with the dentists of this State with a similar object in view. My circular letters were limited in number to four hundred. It was thought best by the executive council that the work be continued with the view of reaching every dentist in the State. This has been done, and from the replies thus far received, (I expect them to come stringing along until next Christmas), I shall

endeavor to give you the opinions thus gathered to the best of my ability.

So far as possible a copy of the following questions was sent to every dentist in this State. So, hereafter, 1st, 2d, 3d and 4th refer to the questions respectively :

1st. Are you a member of any dental society? If so, state which one; or if more than one, state the ones you are now a member of, and how long you have continued such membership.

2d. If not a member, please state your reason for not being one.

3d. Do you think attendance on dental societies beneficial to the dentist, if he goes with the desire to seek and impart knowledge?

4th. Do you think dental societies are properly conducted? If not, wherein lies the fault, and what reform is necessary?

The first group I shall consider are those who are members of this society or some other and who are favorably inclined to dental societies as follows : "I certainly think that the dental society is one of the most important means of dental education open to the profession. They are and must be of the greatest benefit to their members, both practically and intellectually, if they are attended with the proper spirit." Another writes : "I believe on the whole that dental societies are as well conducted as we could expect them to be, considering the common faults and frailties of humanity. I have not the slightest complaint to make about any society with which I am connected. They have all done me more good than I can ever hope to do them." This is from a man for whose character and ability we all have the highest respect.

Another writes: "No man liveth to himself alone. Next after the rudiments of a dental education are obtained in college or by the study of books, the dental society is the grandest institution on earth for the dissemination of views or knowledge, and the development of one's powers in all things pertaining to the practical in dentistry."

"In the main, yes. Of course there is plenty of room for improvement, yet I know of no radical reform I would propose. I think the management of dental societies may safely be left to the processes of evolution. There will always be kickers and wire pullers, but their influence will gradually diminish before the

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power of a broader general and professional culture. The character of the work, both scientific and technical, done by societies has improved vastly in the last twenty years. This is shown very clearly by a comparison of the published literary work as presented before the various societies in later years with that of fifteen or twenty years ago."

"If I had a reason for not belonging to a dental society it would be the cost that is necessary for a poor man, but I think that if he can possibly raise the amount he had better do so, for it is money well expended. If the dentist goes to a dental society with a desire to gain all the knowledge he can, and at the same time has the cause of the profession at heart so that he is willing to impart to others the knowledge he has, it is my opinion that he will be benefited and also the society will be benefited by his attendance. I consider that the dental societies are next to a post-graduate course in its benefits to the practitioners. I have no criticisms."

In reply to question, What reform is needed, if any; "Yes. If not, instead of staying away, like a sorehead, 'kicking' about it, I would adopt the same principle I do in politics—attend the primaries and fight for my idea or principle; so I would attend the dental society and fight to correct what I thought was wrong."

"I most certainly think that the regular attendance at dental societies is the duty of the dentist to his profession, his patients and himself. It is almost the only way we have of promoting a friendly feeling among members of our profession, and attendance upon the meetings of a good society cannot help improving a man's knowledge and encouraging in him a higher and broader professional spirit."

"Invaluable. Would feel justified in making considerable sacrifice rather than fail a single meeting; to miss all would be a calamity. Should expect deterioration and retrogression to ensue in a short time. I have little fault to find with the societies as they are at present conducted. The man who does not seek the societies only has himself to blame in not taking advantage of opportunities presented to him. For he would be a dull man if he would not receive much valuable aid by his attendance."

"There can be no question that attendance upon society meetings is of vast benefit to any one who does not start out with the idea that he knows it all, or that he is or ought to be the

'whole thing.' It begets a fraternal and healthful emulation and stimulates higher professional and social aspirations. A mind capable of perceiving that a thing 'may pay,' although the coin of the realm does not conspicuously appear in evidence, will after a few years of exchange of views at society meetings be forced to the conviction that time spent at such meetings has proved a most profitable investment. Fourth query: That is a matter for each society membership to determine for itself. It is largely a matter of evolution and environment. If a majority of any society thinks its particular organization is not properly conducted, it is entirely within its power to change this. There will always be visionaries and theorists who will be able to prove that if things had only been arranged thus or otherwise matters would have progressed a great deal better, and this class of good fellows many times would be of great value if they pressed their convictions within the membership and meetings. Here they could encourage the progress of evolution in a convincing, deliberative way and be met with argument that would bring to the test the truth or fallacy of the ideas advocated. Exclusion from membership or absenting themselves from meetings, compels them to hide their light under a bushel upon the only occasions where it could be seen by others, and enlighten their darkness effectively. The Illinois State Dental Society, to my mind, is the best working society of its kind in existence; it is a living exemplar of the conservative development of evolution and environment. Its methods of thirty years ago would be ridiculous to now attempt to conduct it under, and it would have been equally absurd thirty years ago to have attempted to conduct it as now. Visionaries, theorists and 'cranks' it has always had, and these are the men that by degrees have brought about change after change in our structure by carrying the majority to their way of thinking. To cut it short, if any particular society is not conducted on lines that after mature deliberation a majority decide it should be, this can easily be so changed as to fit the needs of the times and surroundings, and any one who stays away because this or that thing is not thus or so, benefits neither himself nor the world at large."

"Dental societies are, as a rule, just as well as all other organizations, subject to some limitations. We are not all-wise nor all-good, and there is a certain amount of unwisdom and imperfection in all things human."

This expresses very well the favorable opinions. I have no comment to make, only, that they are to say the least fair, reasonable and just.

Next, unfavorable opinions from nonmembers and their objections. "1st. I do not belong to any dental society. 2d. I have never been solicited to become a member, and it is beneath my dignity to ask for membership in any society of the kind. I have attended meetings many times. I have read the proceedings of most all of them. I presume had there been that cordiality extended that should be, I possibly would have been a member of a dental society to-day. 3d. Yes I do, providing, however, he has the proper spirit and feeling in the matter. But so many big me's go down to the meetings, consume most of the time, no one is supposed to know anything but themselves. 4th. I do not. My answer in section 3, most covers the grounds. We will say Dr. Brown is to prepare a paper on some subject, and there will be from one hour to two taken up with a something theoretical that should be on something practical. Clinical operations, etc., would be of great import to every one in attendance. Then let reformation begin right at home in the society. Shake off all jealous feeling, leave it at home in the office when starting to a meeting, show a warm greeting to any man who will be visiting for idle curiosity, that he is welcome and at home. Hunt up those you know not. Make their acquaintance. There are thousands of good dentists who do not belong to your dental societies, perhaps from the lack of brotherly feeling. Great work may be accomplished; there is much to do, and if there was more time put in some other way to advance our calling than theorizing, I believe it would be good for all concerned."

"Because while I do not advertise, I believe in doing so should a person wish to advertise. There is too much experimenting at most of dental societies—some man trying to get his name up by doing something out of the ordinary, and as a general thing his method is no good."

"Never had time to attend and until within the last year I could see no harm in a small advertisement, but too late saw my mistake or the mistakes of others. I know of members who have paid $25.00 for write-up, and had their cuts put in papers and journals for advertising—nothing less, and I consider this quackery as much as any kind, and I read their papers which they pres-

ent to the society, and it looks as if they were the head of the society. I despise deceit and therefore I did not care to associate myself with them. The fault is your allowing one man to advertise and praise him and let him lead the profession and not allow others the same privilege. Do unto others as you would like to be done by."

"2d. Code of Ethics. Wish to conduct my business in my own way. We are all in the business for money. 'The Boston Dental Parlors' and similar affairs get the most work, and the only way to fight them is to meet them on their own grounds. 3d. Yes. 4th. Yes. Second question states my only objection. The society should not bar out printer's ink. While I do not approve of the concerns mentioned in Q. 2, I do believe in adopting their methods as far as possible when they encroach upon me. The idea that 'Cheap John' does poor work, etc., is a mistake. He is up to date; he buys the best goods and gets the latest appliances. He is here to stay, His office is crowded with patrons. He is not a respecter of persons. He is after dollars and gets them. The professional brother who belongs to the society must let his patients go to 'John' for their dental work."

"Question 2. The dental colleges and dental societies made a monopoly of dentistry, and laws are enacted to make them a monopoly, which are not constitutional. If you will enact a law against *malpractice* it would be more in keeping with the statutes of the country. Enclosed sample of malpractice from a graduate of Baltimore Dental College. Dentists cannot be made; they have got to be born."

"Think the dental societies are not properly conducted. The fault is this: How many dentists of a certain district discuss the questions? Only a few who are fluent speakers, and those who are supposed by the greater number as being authority. Furthermore, nine-tenths of the questions under discussion are not practicable. Have witnessed this in a number of meetings."

"2d. Well, I don't like to be interested in anything which a few men use to crowd themselves along with. (b). I detest heartily all kinds of politics in which societies appear to abound. (c). The societies do not seem to do the profession any good. They *do not* suppress advertising in the letter or spirit of the 'Code of Ethics.' The old and established practioner says: 'The parlors don't hurt me.' The young men have no money to fight them.

(d). The leading men in the societies are very often members of those unmitigated humbugs, 'The dental faculties,' which are usually composed of a lot of money grubbing dentists who dare not advertise themselves for fear of the sneers of their brother dentists, but who advertise (for patients) their schools *and treat all* persons rich or otherwise who present at "the cost of materials only" which is a lie on the face of it. (e). I can learn more by reading a paper and studying the cuts, and can form a clearer idea of it than I could by listening to some man's bombastic, positive statements and bad delivery while seated in a smoke-dimmed atmosphere among a talking crowd of men, many of whom were still partially under the influence of last night's drinking. This of State societies. (f). At the few meetings I have attended, I have been struck by the difficulty of seeing or hearing the clinics without fighting for a place. (g). Societies, as I read them, and as I have seen them in the two or three that I have spent time to visit, are principally 'mutual admiration societies.' Very fine for the admired, but not worth my time and money. (h). Don't believe from reading the published transactions of societies, that they are worth the money spent in car fare, hotel bills and loss of time. (i). The societies don't seem to be able to print their own circulars and notices, but sponge it out of some supply company who in turn must, per force, mulct the whole body of working dentists for an extra profit to cover these expenses. I am inclined to think on the whole that State societies are better for the dental supply houses than the dentists. Under (d), I would say, *all* are not quite so bad but none turn away people able to pay and all make money out of the infirmary.

"3. Yes, to some extent, but the best men—I mean the most particular honest, upright, painstaking, gentlemanly, professional spirited dentists—do not make money enough to spend their time in giving clinics away from home, so we have a good many fellows who talk and demonstrate, but teach nothing.

"4. Not attending societies I am not prepared to speak of conducting them—I don't know. Now, my friend, I have written just as I felt. I do not know who you are—never heard of you—so if I have tread upon your toes, it was unintended, and I beg your pardon sincerely. But I don't believe you belong to the class I have had in mind, who are ever crowding their shallow, but cunning and tricky heads under our noses and hiding the sun. A good society

having good clinics—not too many, but good ones—clinics the work of which all men could look at and resolve to imitate, in their practices, clinics which could be seen in actual progress and by an assistant also on an enlarged scale either on a huge plaster tooth with huge wooden instruments, or on a black board by a good "diagramer," both proceeding in concert step by step—such would be a good thing if it could be had without neglecting one's practice too long. If I could get at you, doctor, I could make myself understood, but paper and ink are poor conversationalists. I thank you, doctor, for the invitation to Peoria, but will be unable to attend—because I do not feel justified in expending that amount of money for what I can easily and quickly get from journals a month later."

"No. 1. Would say member of none; was some years ago a member of the 'Chicago Dental Society.' 2d. I have no time nor money to pay out for no adequate return. 3d. Would be of no interest or benefit to me who have practiced thirty-five years, except it might be, to inspect new inventions and appliances as on exhibition, or to behold some extra and new clinical operation. Seeing how other men do it would no doubt be a help or give ideas to a young practitioner or a new graduate, (and they never learn much at a dental college), also for notoriety or to get their name in print, all this, I myself don't hanker after. 4th. Too much 'gas,' too much jealousy, too much 'big head,' too much selfishness. Dental societies should be radically reorganized, meet once or twice a year purely to help one another in the knowledge and elevation of dental surgery."

"My reasons are many—one reason is they are run and ruled by men who never miss an opportunity to advertise themselves in almost every way, and yet lay down a set of rules taking away that right from members. Another is the meetings are held at the time of the year that I have always been the busiest. 3. I do. 4. I do not. They allow in many instances a lot of old fossils who have outlived their usefulness to take up the time with quack ideas and operations that are a disgrace to the profession and enough to disgust any man who tries to be up to date. I think those old fossils ought to be ruled out. This probably is not so much the case in the State society as it is in the district societies."

"By watching the working of members I have never been led to see any benefit in becoming a member. 3d. If a dentist has a

lucrative business it is somewhat of a question whether he would derive benefit enough to leave his work to attend, even though he would go with a desire to seek and impart knowledge."

"Take two dental journals and always read of meetings—saves time and expense. 3d. Decidedly beneficial. 4th. Yes."

"Will say for No. 1, no. No. 2, never was asked to join, and too busy to pay much attention to the matter. No. 3, yes. No. 4, don't know anything about them; have read, the reports only, and find that nearly all of the members are of different opinions. Would be pleased to hear of the objects of the society."

"I have no particular reason for not being one, only that I never have cared to join. I have been to some meetings but have never derived any particular benefit from them. 3d. I presume they might be of some benefit, as one might get some new ideas, but as a general thing most of us have had some fixed way of doing things and do not like to try any experiments."

"No. 1. No. No. 2. I think they are generally — the State may be an exception — just simply mutual admiration societies where a lot of fellows like the notoriety of telling to some others, who toady to them, what they know, getting at last where the orange is sucked—the pleasant title of 'Has Beens.' 3d. Yes, I think all are benefited. 4th. Never saw one where they didn't fight like cats and dogs, and backbite each other fearfully."

"In reply to the questions I will state I belong to no dental society and never did. My reason for not being, takes time and money, and I think I reap the benefit from dental journals. I think it a benefit to any dentist to seek and impart knowledge, but what I think is more necessary is a law to govern the practice of dentistry in our State, when any man can take six months' demonstrations under another dentist and practice in any part of the State, and the State board stand up and protect him by giving a temporary license just to get $10; why should I take any interest in dental societies which are led generally by our State board men?"

"To your first I must say I do not belong to any dental society. To your second I will answer at length, as follows: During the thirty-five years of experience of picking my daily bread out of other people's teeth, so to speak, I have attended possibly ten conventions with a view to becoming a member or attempting to do so. Have been impressed with the want of proper organization

of the meetings. The average Dental Society meeting will never be complete without one more official than is generally required by deliberative bodies. I hardly know just what his official title should be, but I know very well what his duties should be. He should occupy a central position in the room and be thoroughly competent to lasso and quietly drop out of the window (the higher the better) just about four-fifths of the conceited damn fools that occupy the time of most of the conventions. This done, he should be equally competent to drop his lariat over the heads of any of the men of ideas and bring them to the front for the profitable entertainment of the assembled multitude.

"2d. The only way I would be benefited by membership of a dental society would be in the knowledge received by actual attendance at the meetings. I attend the meetings as often as circumstances permit and get as much benefit out of the meetings as if I were a member. I would be glad to assume the responsibility of membership paying my share to the support of the society and imparting what knowledge I have for the common good—all justly due for the benefits I derive, were it not for what I consider an unreasonable demand—that I agree that the 'code of ethics' shall dictate to me how I shall advertise my business. I am not practicing alone for the 'glory' of the profession, or alone for the good of mankind. Were it not for the money consideration, I would be in some other business. At the same time, I am sure that the dental profession is receiving more 'glory' and mankind receiving more benefit from my being an 'advertising dentist' than if I were one of those hypocritical, deceitful cusses claiming they are working principally for the 'glory' of the profession and the good of mankind. It is but a matter of prudence to put your hand on your pocket book when in contact with such deceit. I am unalterably opposed to the 'code of ethics.' You can't make a gentleman of a bear by any set of rules, nor can you make a mean degraded man a gentleman by any set of rules. The 'code of ethics' is being continually broken and very few have enemies in the society who will produce the evidence to convict. I am opposed to the whole contemptible mess. I believe each man should stand before the public on his own merits unhampered by any rules, allowed to conduct his business as he sees fit. A right to which every citizen of our country is entitled. The public very soon puts a just estimate on every man. Well, I could write page

after page of objection to the 'code of ethics,' but I will dismiss the subject hoping I have made myself understood as to stating a reason why I am not a member of a dental society."

Of this class of opinions I have given you enough, and these are only a few of the many similar ones.

I don't know as I have any comment to make on these now—would prefer to leave that to you who are present here with me.

Another class are those who, while they are not members of any society, think highly of such organizations but for various reasons have not as yet become members. In answer to first query one writes "No." Second. "Neglect." Third. "Too much theory." In reply to invitations: "I never miss one."

"Have found it too expensive a luxury for ordinary practice. Third. I most certainly think societies of greatest benefit when a dentist goes for that purpose. In my own case have found them very beneficial and delightful. Fourth. I do not feel competent to criticise conduct of societies to any great extent, but would say I do not approve of any examinations or restriction of members. The more ignorant the dentist the more need of educating him and the more credit to the profession to enlighten him than to exclude him."

"I am not a member of any dental society. Second. The only reason I have never joined any society is that I never had the money to spare since I graduated; also no one has ever asked me to become a member. Fourth. I have no fault to find with the conduct of societies, unless it would be allowing so many dead head, nonjoining dentists like myself to attend and crowd the clinicians to the annoyance of those that join and pay the bills, but of course the society must have new members and therefore it is necessary to give some latitude in this respect, also to accomplish the object of the society, viz.: raising the standard and skill of the profession."

"My answers are as follows: I am not a member of any dental society and I never was. 2d. I have no reason. I have been in this State but eighteen months and last year I was advertising, so I knew that it was useless to apply for membership until I had reformed. At present I think I am eligible. 3d. I do not think it could be otherwise than beneficial. A man must be a conceited bigot who thinks otherwise. 4th. I do not know enough about your society to say whether it is properly conducted or not. We

need dental societies. God help us if ever there comes a day when there are none!"

"I have not had time or money to join one. 3d. I think a practical dentist as well as a theoretical one can gain more knowledge from a well conducted meeting of a society, and think this is what the dentists of Illinois need more than any one other thing. 4th. I am not well enough acquainted with the doings of the association to know, but my idea is that there should be some protection against advertising officers and unscrupulous persons claiming to know something of our profession."

"I herewith make reply to your circular letter, thanking you for your invitation, which, I am frank to say, is the first invitation ever received to attend your society. The above, in my mind, is one weak point, viz., the failure of the society to create an interest in their work."

This class have felt the grind of "hard times" which is of course a reason which must be left to their own judgment.

But as to a lack of previous invitation, I don't think that will hold good, as I am sure that every program sent out for some years past has had a cordial invitation to all the dentists in the State to visit and join the society at that meeting.

As to the Illinois State Dental Society regulating prices or fees to be charged, that is out of the question, as no society of any kind has such an authority, as that would exceed the authority of the legislature; and as to the advertising the society can only apply the much objected "code of ethics" and expel such members as persist in such a course.

It seems to be the opinion that the Illinois State Dental Society has unlimited resources of power; they think that the society can regulate the actions not only of its own members, but of the dentists throughout the State. This of course is a mistake. The Dental Society has for its prime object the organizing of the dental profession for the purpose of mutual benefit and education in dental science, and not for the purpose of creating offices to be filled by its members for the main purpose of placing them in power. Then again, as to what has been intimated in the opinions just quoted, that the society is run by a favored few or clique of members who see to it that they and their friends are elected to fill all the offices and supply all the clinics, prepare all the papers, and run the society generally. Now if this came from those who

are members of the society such a statement might carry with it some force; but as on the other hand these objections and complaints come from the class of men who are not members of any dental society, the objections fail to carry with them the weight they might have. It will be remembered that the opinions quoted from those who are members of the Illinois State Dental Society are almost all of them in favor of the dental societies and their objects, and while they may differ slightly in their ideas as to the management of such societies, the consensus of their opinion is that the societies are conducted properly and they have no complaint to make. Now if there is any reason to be given why it is apparent at times that a certain class or clique as they may call it, seem to be running the society, that can best be answered by the complaint made by the chairman of the executive committee and the superintendent of clinics. These two committees tell me that it is the hardest work to get up a program for the society because of the persistent refusal of the members of this society and others of the profession to take any part either by preparing a paper or giving a clinic, and so they find that at the last moment they must fall back on some of those who are always willing to work and do their share and more too, in carrying on the work of the society. We can see then that it is this indisposition on the part of the profession to do any society work like preparing a paper or giving a clinic that makes the government of the society seem one-sided.

Another criticism is, that the discussions on the papers read before the society are all carried on by a few men, who have the gift of eloquence which our friends who make so many objections and complaints call the "swelled head." Now just imagine what the effect would be if the same gentlemen referred to as having so much to say should simply keep their seats and have nothing to say like you who are making these objections and calling names. Would anybody derive any particular benefit from the convention of such a society? So, then, as I happen to know these willing talkers are compelled sometimes to get up and say something whether they feel like it or not. But then these objections will not hold good, because take the proceedings of any year of the Illinois State Dental Society and they will compare favorably with the proceedings of any other dental society extant.

Suggestions were made that annual dues were too high. This has been considered by the executive council with this conclusion;

that a reduction of $1.00 would not be enough to materially increase the membership; further reduction the society cannot stand. My opinion is that when the State society grows in membership to four hundred or five hundred, the time will then come for a considerable reduction of the annual dues.

It is not my intention to comment at any great length upon the opinions expressed by this correspondence. I wish to say that I have no disposition to ridicule or make sport of any of these opinions, as I believe every man has written me his honest and candid opinion in answer to the questions sent to him for reply. The objections treated in this correspondence should be treated with consideration, and while they differ widely from my own opinions, I must in fairness accede to them the rights I claim for myself. I also find that in the quotations which I have given you in the forepart of this paper, there is too much for me to answer in a paper of this kind. I hope that we will bring it out in the discussions, and as to any recommendations for increasing of membership of the society, I do not feel as if I would care to make any. Having gathered together the material for this paper and given you that part that is best to use, and as the paper is now of considerable length, I will leave it in your hands for discussion, closing by making the observation that it is impossible to organize an Illinois State Dental Society consisting of two thousand members, taking in every practicing dentist in this State, as many of them are incompatible in temperament with any one else. But I see no reason why the Illinois State Dental Society should not number five or six hundred members and every one of them active workers.

DISCUSSION.

Dr. Geo. H. Cushing, Chicago: I hardly know what to say in opening the discussion upon a paper of this character. The work Dr. Allen has done is one of great value, giving us information regarding many points which we have been in doubt about for a long time. One of these is the reason why the State of Illinois should have so small a number of members of the State Dental Society, thinking as we did that it was a very good society and ought to attract more members. After we have gotten the information it is easy to see that we have innumerable difficulties to meet; but the question how to overcome them is a problem that I think will puzzle us for some time to come. The classes of men

that the report reveals to us as composing part of the profession are very various. There are some of them it would seem to be useless to talk about, or attempt to get into the fold. For instance the gentleman whose dignity was so terribly shocked because he had expected to have a special invitation to become a member of this society, and to be received with a band of music, etc. He must have been a very precious article, and will probably be safely cared for by himself, and we should not hope for any great benefit if he were here. There are a good many other gentlemen who have been thirty-five years in practice and claim to know it all. We would not expect to get much information from such men if they became members, because they would keep all of their knowledge to themselves. It is useless for us to hope for any good from this class of men. But there is a large proportion of those who have expressed adverse criticisms, or given us the reasons why they have not become members of this society who, if they could be approached in the right way and by the right men, would become valuable members. There is no doubt of that in my mind, but to say how we have to reach those men is a difficult matter. There are very few who are not open to reason and to influence in the right direction, when it is brought to bear upon them by the right men.

There was much said in the address of the president with reference to influencing individuals and coming together in fellowship. That is one of the ways in which we are going to accomplish something if we accomplish anything at all. Perhaps it is the best way. I think it is. But how to form a fellowship with some of these men is a question. In some places they can be brought together in the manner spoken of by the president, after the manner of the Streator Fellowship Club. There are few communities in which these influences cannot he brought to bear on individuals. These men must be induced to take an interest in subjects of this character. It is astonishing to see so much indifference and ignorance on part of the profession at large with regard to dental societies. One of the gentlemen said that he did not know Dr. Allen. He wanted information as to what were the purposes of this society—what were its objects. That man must have a vast amount of ignorance when he cannot conceive what a dental society is for. I cannot offer any suggestion other than that

offered by the president regarding the matter of fellowship clubs, brought about in the way he intimated. There is one point to which I want to call attention. The impression seems to be conveyed by the president's address that we are not doing as well as other people; that the profession and the State society are not doing as well as the societies in other States. That I think will be found to be a very great mistake. I am told by Dr. Ottofy that, as compared with New York, we have about the same number of members.

Dr. Ottofy: New York's State society has a hundred and fifty-one members and we have a hundred and ninety-three, although in New York State there is a vastly greater number of dentists. Pennsylvania's State society membership is smaller.

Dr. Cushing: The number of members belonging to our State society is equal to the number of members of the American Dental Association, which is our national organization. I think we have the same number exactly, so that you see we are not behind. However, this is no excuse for our not having more members, but we are doing as well as other parts of the country, and we believe and claim that our professional standing, our interests and aspirations are as high as those of any other State.

I want to make one reference to an impression which the president's address gave this morning, namely, with reference to the limited influence of the State society. He quoted the number of members, but he forgot to state how many members there were and had been from the organization of the society. There are a large number of men who joined and have ceased to be members, and it must not be forgotten that these men have had the good influence of the society for whatever time they were connected with it. There have been about four hundred and thirty all told from the organization who have joined this society, and to-day we have a hundred and ninety-three members. They are constantly coming and going in that way. Some are dropping out, others join and only remain for a little while. The influence has been more far reaching than has been conveyed by the president's address, because there has been a larger membership. I do not know how we are going to stir up the profession as a whole unless we can get a dental Moody. We want an evangelist to go about and move the profession, make them cry and laugh and stir their enthusiasm. Until we get something of that sort I do not know

how to reach these men except in a small way by fellowship gatherings. If we had a strong man, who had the magnetism to go out and talk to the profession, we might do much good. We would have to keep him at it steadily and start a revival, so to speak. Until we take an active interest in these things we are not going to accomplish very much. I am satisfied we can do more than we have done—many of us. We must realize the fact that we are sometimes lukewarm in the matter, and that more could be accomplished if we felt that we ought to talk to every brother practitioner that we meet and stir him up, and thus stimulate him to take an active interest in the profession at large.

Dr. J. G. Reid, Chicago: A word or two in reference to a point made by Dr. Allen. Opposition seems to have been offered by some one who has been a member of the executive committee. I am speaking from my own standpoint. I say it with great pleasure and pride, not only for myself but for the members of this society, that I have never approached a man by letter or otherwise for assistance in making up this program who has declined. I have not with but one exception received a letter to the contrary. Personally, it has been a pleasure to me to get up this program, and I could not consistently with my knowledge and information make any such objections as were stated in Dr. Allen's paper.

Dr. T. W. Pritchett, White Hall: I did not hear all of the remarks made by Dr. Reid, but I caught a word or two in reference to some objections that had been made by some as quoted by Dr. Allen with reference to selecting clinicians, that they should be the favorite and best known ones, and all of that sort of thing. I wish to say, so far as the organization of the clinics this year is concerned, I sent out personal invitations from the beginning outside of Chicago, and more particularly to members who had been for some years connected with the society, but who had not taken a prominent part in its proceedings. I did this to give them an opportunity to accept or reject. I pursued this course mainly throughout all my work in making up the program of clinics. I make this explanation in order to show that no favoritism has been shown, but I have endeavored to give those men who have not previously taken a prominent part in our work an opportunity to accept places as clinicians. Some of the answers I received were courteously worded, and some of them said in a pleasant way that they had not been asked to give clinics before.

Dr. Louis Ottofy, Chicago: This investigation of Dr. Allen grows out of the fact that the membership of the society has increased, but slightly during the last ten years. There has been practically no growth during the last ten years; the net increase being about three members per annum. The inquiry instituted by Dr. Allen cannot help but result in good. The men who are going to become members of this State society are the ones who did not answer the doctor's circular letter. The replies to the circular came from the men who will never come to the society, who are not the right kind of men. The men who have not answered the circular do not want to state their reasons, and these reasons are in all probability financial considerations. There is no necessity in writing them as it is not going to help things any. I have no doubt there are many gentlemen who would like to come and join the society, but cannot afford it. These men we have not heard from, but they will be with us by and by.

There is also a misconception of the number of dentists in the State. I have heard it placed all the way from two thousand to twenty-five hundred. The S. S. White Dental Mfg. Co. has probably the most complete list of dentists in the State, and I am told they have a list of eight hundred and eighty-three dentists in this State outside of Chicago. I tried to get a look at the list of the new directory for 1897 that is to appear in Chicago, but they would not let me see it. I am informed that there are about eight hundred in Chicago. We must eliminate a large number of men who would never join this society, to whom it is useless to appeal at the present time. The number of Chicago dentists who attend society meetings is between two hundred and fifty and three hundred. Of the four dental societies in Chicago, some of the members belong to one or two, and some of them to three and four societies. Out of the eight hundred* dentists in Chicago we may safely say that there are only two hundred and fifty who belong to societies. There is no reason why every one of those men should not come in here. The proportionate membership from Chicago is larger than that from the country, and consequently the objection sometimes raised that Chicago men run the society, is simply a natural condition of affairs. They number nearly one-half and if they are here they must take an active part. The country members can do much to get rid of that feeling by joining the State society, in larger numbers.

*The City Directory for 1897 gives the number at 856 [July 26, 1897.]

I do not see any ground for objections to the character of the work done by the society. I think our society has done what no other State society has ever accomplished. It has generally made up its program from its own members. Our papers are prepared and read as a rule, with rare exceptions, by the men who live and practice in this State. Once in a while we have invited some one from outside of the State to read a paper or give a demonstration and paid his expenses, and at the same time we have felt that as good papers or better could have been read by some of our own members. I regret that although I have been a member of the society for sixteen years, I do not remember of bringing any one into the society. I have talked to a great many and urged them to join the society.

Dr. Taylor brought with him two or three men who came with the avowed purpose of joining the society. I think each of us should endeavor to secure a member for the State society, even if we have to pay his expenses.

A remark has been made that some of the gentlemen did not come because they had not received an invitation. I can see some cause for a feeling of soreness on that score. I thought when I joined the society that I ought to have an invitation to do so. It might be a good plan if the Secretary had a circular letter printed placing them at the disposal of members to be used as a personal invitation to dentists to join. The program is an invitation, but it is not generally so considered. I have sometimes thought we could improve and enlarge the society by having a meeting in Chicago. The society has not met in Chicago for the last twenty-five years. Of the men who joined at that time, seven are in good standing today. The effect of the Chicago meeting was good. I do not know how many men would come in to stay, and it would be simply an experiment.

But there is a bright side as well. After looking at other organizations, I am proud to say that the Illinois State Dental Society has held not only its own, but more than its own. Social organizations in which men are continually dropping out, have gone down, all organizations having suffered during the past five years. The only organizations that can be said to flourish are bicycle organizations, and even some of them have gone down. Many social clubs have lost heavily in membership. We have not only held our own, but have gradually, though slowly, gained in membership.

Dr. J. G. Reid, Chicago: A gentlemen asked me when I came into the room what I had to suggest toward increasing the membership of this society. I answered him by saying, bring a man yourself. I said I have gotten three,and I can pledge myself to get a man here next year, and if every member would agree to pledge himself to bring a man here, you will double the membership of the society at the next meeting. I do not believe we have a member here but what has sufficient influence to impress upon a man the importance and value and the advantages to be gained from joining this society.

Dr. J. A. W. Davis, Galesburg: What about the requirements for coming into this society? Shall the candidate be a church member, a man who never touches whisky or beer? Must he be a member of the Masonic order?

Dr. Edmund Noyes, Chicago: He must be a decent sort of dentist. That is the theory on which we proceed, and we act up to it as closely as we can. That is the standard, and I think every board of dental examiners will strive to maintain it. We need nothing further than that. Several men have made the objection that they have not been invited to come into the State society. There are two things opposed to that. Why should a man be invited to join such an organization as a State dental society any more than he should be invited to go into a dental college as a student if he wants to study dentistry? It is a thing he should do because it is to his advantage to do it. It is a part of his education. He should seek, and not wait to be sought. The next point is with reference to this announcement in the program. Something like it has been announced ever since I have been a member, and a copy of the program is sent to every dentist in the State. No man can reasonably say that he has not received a sufficient invitation to join this society. It is an absurd contention.

It seems to me, one or two words more should be said relative to the question which was to a slight extent under discussion this morning, namely, the exclusion of outsiders from our clinics; I mean all practitioners in the State who do not belong to the society. In respect to all of our proceedings, except the clinics, there is the same reason for open handed hospitality that there is for the generous publication of our transactions. An assembly room can be gotten large enough for all who wish to come to hear papers and listen to discussions. There is no reason in the world

why every dentist should not come in yearly and listen to these papers; but the number who can see the clinics is strictly limited, and the reason why outsiders who have no right there should be excluded is because every outsider who sees a clinic absolutely excludes some man who has a right to be there.

Dr. C. R. Taylor, Streator: With regard to there being about 2,000 dentists in the State, I will say that I got my information from Dr. Allen and the S. S. White Company. Its manager wrote to me that the number was between 1,900 and 2,000, not counting the recent graduates of colleges who have started to practice in the State this spring. There is some discrepancy in the information we have received here this afternoon. In my address this morning, in speaking of there being about four hundred dentists when this society was organized, I am very much in doubt about there having been that many, but it was the best information I could get on the subject. The S. S. White Company could not give definite information from the fact that they had lost their records of dentists in the State in the great Chicago fire.

Dr. Allen (closing the discussion): In reference to what has been said about the refusal to give clinics, I secured the information from Dr. Johnston's report a few years ago, when he said it was the most difficult thing to get anybody from the country to give clinics, and that finally he had to call on the Chicago members for assistance in making up that portion of the program.

CLASSIFICATION OF CAVITIES, AND RULES GOVERNING THEIR PREPARATION.

By W. E. Harper, D. D. S., Chicago, Ill.

The subject in its present form is so treated trusting that the formulation of rules makes each point more clear and gives to them emphasis.

The diagram and classification of cavities given with rules for the preparation of each division practically covers all we are called upon to fill and enables us to decide upon at least one of the best methods for the preparation of any particular cavity.

For a thorough understanding and an intelligent discussion of the subject, I feel that it is necessary to show the cavity as a whole and keep it in view while elaborating the smaller details, that we may fully understand their relation one to the other and to the whole, and to the surrounding tissue. I hope to accomplish this with the large models and illustrations.

Much of the rules as given for the preparation of margins, seats and retention are based upon the requirements as presented to this society by our most worthy and honored member, Dr. G. V. Black; and in presenting this paper to you, the following quotation expresses my position exactly:

"I have here made only a nosegay of flowers and have brought nothing of my own but the string that ties them."

RULES FOR THE PREPARATION OF MARGINS.

Rule 1. Extend cavity margins in every direction until sound enamel is reached.

The application of this rule requires special care in cavities occurring in the gingival third of the labial, buccal and lingual surfaces due to erosion or contact with secretions from diseased tissue.

Rule 2. A fissured, sulcate or angular developmental groove should be cut out in its entire length and included in the cavity.

In cavities occurring on the lingual surfaces of the superior

incisors and occlusal surfaces of the bicuspids and molars, this rule should be strictly enforced.

Rule 3. Further extension should be made, if necessary, until full length enamel rods are supported by dentine.

In cavities for gold or amalgam, there are no exceptions to the application of this rule. The cavity margins should be extended by cutting the enamel rods in the direction of their length with a keen chisel. (When doing this the line of cleavage should be noted to enable us to best decide what bevel to give to the marginal edge.)

Rule 4. "Cut the enamel to such a point that the surface of the filling may be so formed that the enamel margin will be self-cleansing, or be protected by the gum margin." (G. V. Black.)

The labial, buccal and lingual margins of all proximal cavities should be extended sufficiently to permit contact of the lips, cheeks and tongue with the enamel margin, and to be further cleansed by the excursion of food over them during mastication.

The gingival margin should be carried beneath the free margin of the gum, or in cases of extreme recession or destruction of this tissue, to the widest part of the interproximate space. This would permit the circulation of the saliva to constantly render the gingival margin clean.

Rule 5. "Do not form an enamel margin in such a position as to leave a small portion of enamel between it and one of the developmental grooves." (G. V. Black.)

Margins on the occlusal or incisal surfaces which approach closely a developmental groove should be cut to or beyond that point, because of the great liability to breakage on these lines.

Rule 6. The outline of enamel margins exposed to view (as on the labial surfaces) should be in definite curves or straight lines.

Cavities occurring on the labial and buccal surfaces of the ten anterior teeth should be cut on harmonious curves or straight lines for æsthetic reasons.

Rule 7. The labial, buccal and lingual margins (the fillings of which are exposed to the force of mastication) should be parallel to each other and at right angles to the seat of the cavity.

In following this rule there is less danger of leakage along these margins and walls, as in case of shrinkage or slight crushing of the filling material, adaptation is still maintained at these

points; if, on the other hand, these margins and walls are permitted to overhang, the filling is crushed against the seat and drawn an equivalent amount from the buccal and lingual margins, resulting in leakage.

All margins should be cut smooth, and after applying the above rules, should be beveled, so as to avoid short ends and insure full length enamel rods.

RULES FOR THE PREPARATION OF THE SEAT AND STEP OF A CAVITY.

Rule 1. The seat must be flat or in steps (which is equivalent) and at right angles to the long axis of the tooth and direction of the strain.

The crushing strain is the force of mastication brought directly upon the exposed surface of the filling, and through it to the gingival wall of the cavity. This gingival wall, with any additional steps nearer the occlusal surface, constitutes the seat of the cavity, as it must carry the load.

The crushing strain is most effectually resisted by preparing the seat and steps perfectly flat, and at right angles to the direction of the force, thus avoiding any tendency to sliding under the influence of heavy strain.

To cut the seat, I use an inverted cone bur, holding it parallel to the length of the tooth.

Rule 2. The extent of the seat and step must be equal to the surface of the filling exposed to the strain.

DEFINITIONS.

Enamel margin.—A line on the surface of a tooth, forming the boundary of the cavity.

Marginal edge.—The cut surface of the enamel margin, including its thickness.

The classification of cavities given is based upon their form and location, and by its means we are able to formulate a few sets of rules which practically meet all the requirements for cavity preparation.

Presented in the form of a diagram, its simplicity can be readily appreciated, and enables us at a glance to assign any cavity to its proper class and division; thus insuring the application of rules best adapted to the requirements of the case.

In my judgment, the rules as presented would make ideal cavities, and should be enforced in general with but slight modifi-

cation, although they permit considerable latitude should the operator have good reasons for the change.

If it be conceded that the practice so earnestly advocated by Dr. G. V. Black, of extension for prevention, is advisable, it will be seen by reference to Figs. 5, 6, 10 and 12, that the extension of margins advocated in these rules is the minimum consistent with its accomplishment. A cavity prepared as shown by the dotted line g, Fig. 12, would have its buccal and lingual enamel margins i, j, located at the most vulnerable point; and if cut sufficiently to the buccal and lingual to render them in any measure self-cleansing, they would be too weak to permit grooving for retention, the step on the occlusal surface being the only safe method. So that in my judgment the rules given for cavities occurring on the proximate surfaces of bicuspids and molars, making contact with other teeth, meet practically all cases.

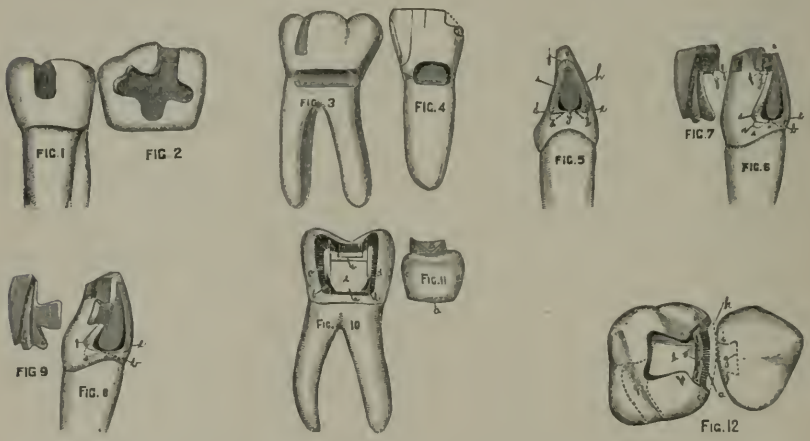


Fig. 1 and 2. The lingual surface of an upper molar and the occlusal surface of a lower molar showing cavities of class 1, division A.

Fig. 1. Shows the lingual extension of a cavity upon the occlusal surface including the entire length of the disto-lingual groove which is so generally sulcate or fissured.

Fig. 2. An occlusal cavity involving all of the developmental grooves, including the buccal which often terminates in a pit midway, occluso-gingivally, on the buccal surface.

Fig. 3 and 4. Show cavities of class 1, division B, a buccal and labial cavity, the gingival margins of which have been extended beneath the free margin of the gum into the cementum for protection and to avoid the thin triangular plate of enamel at the gingival line.

Fig. 4. Also shows a disto-incisal angle cavity, a; in these cavities the seat should be prepared flat to resist the force; if cut as shown by the dotted lines the filling is crushed against the inclined surface and the strain placed upon the retention which will result in a failure sooner or later.

Fig. 5. Represents a cavity of class 2, division A, on the mesial surface of an incisor; (the dotted lines) a, b, show the triangular retainers cut in the dentine of the linguo-gingival and labio-gingival angles of the cavity; (the dotted line) c, show a slight undercut in the dentine of

the incisal angle (not a pit); d, e, the linguo-gingival and labio-gingival enamel margin cut in short curves and carried well to the labial and lingual for protection; f, enamel margin of the incisal angle; g, the gingival margin and wall; h, labial margin and wall; i, lingual margin and wall.

Figs. 6, 7. Represent a mesio-incisal cavity of class 2, division B, with a filling such as would fit in it. The letters a, b, c, f, g, and h, Fig. 7, represent the parts of the filling to fit in the corresponding parts of the cavity indicated by the same letters a, b, c, f, g and h, Fig. 6. Fig. 6 (the dotted lines) a, b, show the triangular retainers cut in the dentine of the linguo-gingival and labio-gingival angles of the cavity; c shows a shallow labial step; d and e the short curves on which the labial and lingual margins unite with the gingival; f, the lingual step or seat; g (dotted lines) shows a groove with square ends cut in the dentine two-thirds the length of the lingual step; h, the labial plate of enamel, supported by dentine; i, the gingival margin and wall or seat of the cavity.

Figs. 8 and 9. Represent a mesio-incisal cavity of class 2, division B, with a filling such as would fit it. The letters a, b, c, Fig. 9, represent the parts of the filling to fit in the corresponding parts of the cavity indicated by the same letters a, b, c, Fig. 8.

Fig 8 (the dotted lines), a, b, triangular retainers; c, dovetail cut on the lingual surface; d, the gingival wall or seat of the cavity; e, f, short curves uniting the labial and lingual margins with the gingival.

Fig. 10. Represents a mesio-occlusal cavity class 3, as seen from the mesial surface of a superior first molar; a, gingival wall or seat; b, occlusal step or dovetail retainer; c, lingual wall; d, buccal wall; e, axial wall; l, l, slight undercuts in the dentine of the bucco-gingival and linguo-gingival angles of the cavity to facilitate the starting of a gold filling.

Fig. 11. Filling removed from the cavity, shown in Fig. 10, a, gingival margin; b, dovetail retainer on the occlusal surface; c, lingual margin; d, buccal margin.

Fig. 12. Shows the occlusal surfaces and point of proximate contact of the superior first molar and second bicuspid, also an occlusal view of the mesio-occlusal cavity shown in Fig. 10, a, gingival wall or seat; b, occlusal step; c, lingual wall; d, buccal wall; e, axial wall; (dotted lines) f, shows the outline of the retention on the occlusal surface when the disto-lingual groove is included in the cavity; (dotted line) g, a cavity in which the buccal margin (i) and the lingual margin (j) have not been cut to a self-cleansing point; (dotted line) k, shows the contour of a finished filling.

CLASS 1 — **All cavities on any surface other than proximate.**

A :—Cavities arising from structural imperfections in pits or fissures.

Rules for Preparation.

Illustrated in Figs. 1 and 2.

Extend the margins to meet the requirements of Rules 1, 2 and 3.

Retention :—Slight undercut in the dentine all around the cavity, or in at least two of the walls which oppose each other. Best made with a small inverted cone bur.

Bevel of the Marginal Edge :—Should be obtuse; five to ten degrees.

B :—Cavities on labial, buccal or lingual surfaces, caused by contact with secretions from diseased tissue, or the product of fermentation

Rules for Preparation.

Illustrated in Figs. 3 and and 4.

Extend the margins to meet the requirements of Rules 1, 2, 3, 4 and 6.

Retention and Bevel of the Marginal Edge :—Same as for Div. A.

CLASS 2 — All cavities on the proximate surfaces of incisors and cuspids.

A:—Cavities which do not involve the mesial or distal angle.

Rules for Preparation of Class 2, Div. A.

Illustrated in Figs. 6 and 7.

All margins should be extended to meet the requirements of Rules 1, 3 and 4. The labial margin *h*, should be extended labially sufficiently for direct access to all parts of the cavity and to permit the gold to reflect light. The lingual margin *i* should be cut to the proximo-lingual line angle. The gingival margin *g* should be located well beneath the gingiva, or in case of extensive recession, the margin should be cut to the widest part of the interproximate space so that it may be readily cleansed by the circulation of the saliva. The linguo-gingival and labio-gingival enamel margins *d*, *e*, should be in short curves and situated well to the labial and to the lingual for protection. The enamel margin *f* of the incisal angle should be carried beyond the point of proximate contact. Much of the extension of margins can be made by cutting the marginal edges obtuse (bevel ten to thirty degrees) this is advisable in the situation of these margins as the enamel rods vary much from a line at right angles to the external surface of the tooth in cavities of this division.

RETENTION:—Two triangular retainers, *a*, *b*, cut in the dentine of the linguo-gingival and labio-gingival angles. By reference to Fig. 5 it will be noticed that these retainers (indicated by dotted lines) continue as grooves along a portion of the lingual and labial wall, disappearing about the middle of their length. In the gingival wall *g*, the widening of the retainers *a*, *b*, stops or disappears at the center, labio-lingually. Under no circumstances should the gingival wall *g* be grooved across from labial to lingual as there would be great danger of the wall bulging out and checking at or near the center of its length when the gold is condensed into it, resulting in failure at a point difficult to detect. These retainers are opposed by a slight undercut *c* (shown by dotted lines) in the dentine of the incisal angle (not a pit). The axial wall should be left convex for protection of the pulp.

BEVEL OF THE MARGINAL EDGE:—Ten to thirty degrees.

B:—Cavities which involve the restoration of the mesial or distal angle.

Rules for Preparation of Class 2, Division B.

Illustrated in Figs. 6 and 7.

In cavities of this division be sure that you have enough space to restore full contour. Trim off the weak angle, extend the margins to meet the requirements of Rules 1, 3, 4, 5 and 7. The gingival wall or seat *i*, should be prepared according to Rules 1 and 2 for seat preparation. The labial and lingual enamel margins *d*, *e*, should join the gingival in short curves situated well to the labial and lingual for protection.

RETENTION:—Two triangular retainers, *a*, *b*, prepared as described for division A of this class, except that in this division the retainers should be as large as the dentine of the tooth will permit. There is practically no labial and lingual wall as in cavities of division A, so that the grooves from the retainers continue toward the cutting edge in the axial wall; these grooves assist materially in building up the gold but do not offer much retention.

To most effectually resist the tipping strain, a flat step, *f*, is cut chiefly at the expense of the lingual surface, one-sixteenth to one-eighth of an inch deep from the cutting edge and about the same extent mesio-distally. From the extreme end a groove *g* (shown by dotted lines) is cut two-thirds the length of this step (this must be in the dentine and should have square ends) A labial step, *e*, is now made with a smooth carborundum wheel. This step should be deep enough to permit insertion of gold sufficiently thick to resist wear and the strain of occlusion and to protect the labial plate of enamel which must be supported by dentine.

BEVEL OF THE MARGINAL EDGE:—Five to ten degrees.

In many teeth calling for cavities of this division the labio-lingual diameter of the incisal half of the crown is so reduced that it would be necessary to sacrifice too much of the lingual surface of the tooth to locate a step at this point and cut to the dentine. In these cases the cavity is prepared as shown in Figs. 8 and 9. A dovetail retainer, *c*, (instead of a lingual step) is cut slightly deeper than the enamel. This should be located as near the cutting edge as the tooth substance will permit, so as to have its bottom or axial wall in the dentine. The rest of the cavity and seat is prepared exactly the same as described in Fig. 6.

CLASS 3 — All cavities on the proximate surfaces of the bicuspids and molars.

Rules for Preparation of Class 3.

Illustrated in Figs. 10, 11 and 12.

Extend the margins to meet the requirements of Rules 1, 2, 3, 4, 5 and 7. Join the buccal and lingual with the gingival in short curves to carry them as near a self-cleansing point as possible. The gingival wall *a*, with a step *b*, cut in the occlusal surface forms a substantial seat and is prepared as directed in Rules 1 and 2 of rules for seat preparation.

RETENTION :—A dovetail retainer *b*, is cut on the occlusal surface slightly deeper than the enamel, forming a step with the seat of the gingival wall *a*. This retainer should include all imperfections which may be found in the developmental grooves of the occlusal surface, and its diameter at the neck *h*, *h*, should be very little less than at its widest point. A slight undercut is made in the dentine of the bucco gingival and linguo-gingival angles to facilitate the starting of the gold in filling.

In teeth in which both proximate surfaces are involved the cavities should be connected by a step extending from mesial to distal through the occlusal surface.

BEVEL OF THE MARGINAL EDGE :—Ten to fifteen degrees.

DISCUSSION.

Dr. C. B. Rohland, Alton: When Dr. Harper kindly showed me his models, and I grasped the significance of his admirable system and saw the clear and logical presentation of his subject as exemplified in these rules, I was simply lost in admiration; and since I have heard him here at greater length, I am free to confess I have not yet gotten over it. This is the best, and I may say the only real, logical, scientific presentation of this subject that I have ever seen or heard in any society. It is a subject that only lately has received the attention it deserves, and it is singular that we as a profession should have groped along so many years without any very definite or scientific methods for the proper preparation of cavities. In a general way, of course, its importance has always been recognized; but what proper preparation meant then is an entirely different thing from what it means now, for it is only within the past six or eight years that the principles have been formulated which evidently furnish the inspiration to this very able paper of Dr. Harper's, and which he so gracefully, though too modestly, has acknowledged in the quotation, that he has simply "brought together here a nosegay of flowers, to which I have added nothing but simply the string that binds it together." I think we will all admit that he has done more than that. At least the string he has furnished is not the least important part of the nosegay.

Before this time our conception of our full duty in the preparation of a cavity was thought to be accomplished when the affected tissue was all removed, sound margin reached and the cavity shaped to retain the filling. The "causes of failure" in our fillings was always a favorite subject with our speakers and essayists; and the reasons usually given were lack of thoroughness in the preparation of the cavity, and faulty manipulation of the filling material. The cervical and adjacent margins were always recognized as the danger points in proximal fillings, and much time and thought were expended in devising methods to overcome the difficulties of reaching these situations and insuring the perfect adaptation of the filling material. One operator would use "soft" gold in these places, another would cure the trouble with tin and gold, another advocated amalgam and gold; all having but the one idea of securing perfect adaptation of filling material in order to render these points absolutely safe. I well

remember one speaker, in order to illustrate the fallacy of filling proximal cavities at the cervical margin with cohesive gold, bringing before the society two centrals which he claimed he had extracted but a short time before. He said they had been filled by an operator of known ability, some ten years previously, with cohesive gold. "Now," said he, pointing triumphantly to decay which was making its appearance at the cervical margins of both fillings, "you see how impossible to perfectly adapt cohesive gold to these margins. Had these teeth been filled with soft gold they would have been good to-day." In this particular case the length of time and amount of decay alone disproved "imperfect adaptation," and it never occurred to him that the sole cause of failure lay in the failure to apply the doctrine of extension for prevention The idea of extending margins beyond danger lines to prevent failures was never broached in all my reading or hearing until our own incomparable Black gave to his students and the profession his theory of "extension for prevention;" and it was not until that time, and until his series of articles appeared on the proper management of the enamel margin, that the preparation of cavities was put upon something approximating a scientific basis.

As far as I understand Dr. Harper's rules and methods, I do not take issue with him on any material point; and on that account, and on account of the great importance of the subject, I have approached the discussion of it with considerable diffidence. When one thoroughly agrees with all the material points made, all that is left is simply to endorse what has been said; and when a subject has been so thoroughly, so logically and lucidly presented, endorsing all the points that might be considered worthy of emphasis would simply be repeating the entire paper. His classification of cavities I consider admirable, and his rules are based on sound mechanical principles. To my mind they are beyond dispute, and do not admit of argument. The only point I can see for legitimate difference of opinion is on the extent of their practical application. There are no rules, no methods that will admit of universal application. Cases may present themselves in which the conditions are such that one operator might feel a strict application of the rules would be unwise, while another would consider the reasons contraindicating insufficient. Here there may be quite a difference of opinion. That I admit the soundness of Rule 3, for instance, does not imply by any means that I shall in all cases

rigidly follow that rule. I can conceive of conditions that in my judgment might even make the rigid following out of this rule bad practice. But we must have some ideal to work up to, and we must then recognize the fact that just so far as we depart from that ideal, so far do we run the risk of future disaster.

I have nothing further to say on this subject except to emphasize its importance. Heretofore we have spent a great deal of time studying how to manipulate our filling materials, and our advance has certainly been greater in that direction than in this; and it is only lately that, as I have said, this matter has taken form and shape approximately scientific. The subject is worthy our most careful consideration, not only while the doctor is talking so interestingly and exhibiting his beautiful models here, but at home in our offices and laboratories. By painstaking study and practice along the lines laid down by Dr. Harper, we will, I am sure, make greater advances in the saving of teeth than we have ever done before.

Dr. C. N. Johnson, Chicago: I feel a great deal as Dr. Rohland did when he said that the subject was completely covered by the essayist, and there were no points with which to disagree. I believe it is one of the most systematic, most scientific presentations of this subject that we have ever had, and these models in the demonstration have carried our ideas very closely home. I read a paper on this subject myself last week, namely, the management of proximal cavities in molars and bicuspids. There is one point in this cavity here (illustrating) that I wish to speak about particularly, and that is the formation of the buccal and lingual walls. As represented in the model and as advocated by the essayist, these walls slope invariably in this direction, sloping from the axial wall, leaving the axial wall much narrower than at the enamel margin. I differ slightly in my preparation of these cavities from that form of these walls. I believe if it is possible to get some retention along these walls we will have a safer filling with that retention than without it. With this form of retention we depend entirely upon the strength of the filling as it approaches the occlusal step. If the filling stretches at this point from continued impact in mastication it causes a leak along the buccal and lingual walls which sooner or later will result in failure. The essayist advocated a strong filling at this point, as the proximal portion of the filling approaches the occlusal step, to prevent failure, but we are not

always enabled, especially in some forms of bicuspids, to get a sufficient bulk of the filling at that point to be sure it will stand the stress of mastication. In these cases where the triangular ridges of enamel on the cusps approach each other in such a way, that in order to get a broad seat we must drill under them and weaken them, I do not extend the cavity to where the essayist does at that point. In molars it may be done, but not always in bicuspids. Where it is necessary to leave this portion of the filling more or less narrow, on account of danger of weakening the buccal and lingual cusps, in order to make the filling safe we must depend somewhat upon anchorage along the buccal and lingual walls. I believe greater solidity and greater security of the filling can be had, not by deep grooving, because I am opposed to it, as it has all of the faults spoken of, but by making the walls more nearly parallel and sometimes extending them so that the width of the axial wall is slightly greater than the width at the inner margin of of enamel at this point. We may do this in many instances without weakening the walls perceptibly, and in that form of cavity preparation we have the filling dove-tailed into place. We all know a great many fillings stand the test of years which simply depend for anchorage along the buccal and lingual walls alone, without any anchorage step at all. A case occasionally comes to me, and especially on the first lower bicuspid, where I have to depend for anchorage along these walls rather than to extend the cavity in the occlusal step.

We have in the lower first bicuspids the enamel on buccal cusp meeting the enamel on the lingual cusp, the latter being short, and perfect union of enamel between these cusps. It is not an element of strength to cut through the enamel and weaken the tooth. In some instances anchorage may be gained along the buccal and lingual walls for retention of the filling. The form of the filling should be such that the marginal ridge is not reproduced. Fillings in the first bicuspids especially should slope in such a manner that the cusp of the opposite tooth has a tendency to force the filling into the cavity against the axial wall.

As to this whole question of anchoring fillings we shall work more intelligently when we subject each one of our patients to tests as to the force of mastication in that mouth.

Take a slim girl, who has apparently not much muscular power, and put a filling in her mouth, it is sometimes astonish-

ing the force of mastication brought upon that filling. It is of course best to anchor our filling as securely as possible, with safety to the tooth, and we should take advantage of every means to make it as firm as possible, even to retaining it between the buccal and lingual walls.

Just one other point. I am sure, that if this paper had been presented to a great many dental societies, it would have been condemned almost in toto, because of the radical measures advocated, but I do not believe they are any too radical. I think we have to acknowledge in all operations upon the teeth that we are not always able to live up to the ideal, but that the nearer we approach the ideal the more permanent will be our work.

The instrumentation of this subject is important, so much so as to call for a paper in itself. The doctor has covered so much ground that he has not gone into many of the details connected with this work. In the preparation of every one of these cavities there is material enough for a paper, and the method of instrumentation is one of the most important things in the consideration of this subject.

I commend the use of the technical terms he has employed. He has used definite terms throughout the presentation of his paper. He has not made use of one wrong term in the discussion of the whole subject, showing that he has thoroughly studied its nomenclature. He has followed a definite method of nomenclature from beginning to end, so far as the principles are laid down. I agree with him in toto with the exceptions I have made, and I think the society may well congratulate itself upon listening to a paper of this kind.

Dr. C. B. Rohland: I desire to ask Dr. Johnson a question. He speaks of sloping the surface of the filling at this margin. If the filling is sloped, and supposing there is a proximal filling in the other tooth, it makes a V-shaped sort of space. Now, what will prevent the tendency of crowding of food down into that space, thus spreading the teeth? Supposing, for instance, one tooth is unsupported, what will prevent crowding of the food down so as to spread the teeth apart and let the food get into the interproximate space?

Dr. C. N. Johnson: If we have a small contact point, let it be located here (illustrating), that far down we will say, the actual area of that contact point should be so narrow that

nothing can be caught between these teeth. Supposing we have a fiber of meat caught between the teeth (and they can never be held so tightly together that at some time or other the food will not be forced between them), if we have a broad contact point, it will be held there to decompose and decay, but where we have a narrow contact point, the food, if forced between, is carried away and not retained, provided the gum comes up and fills the interproximate space.

So far as wedging teeth apart is concerned, there is no more tendency with that form of sloping filling in this way than there is in any other form of contact, because the food coming between the teeth is not retained.

Dr. C. B. Rohland: They would not be forced apart if one were unsupported?

Dr. C. N. Johnson: That would occur anyway with any kind of contact point. If one tooth is unsupported laterally the tendency is to move away from the other tooth.

I want to say a word in this connection in reference to the paper read by Dr. Black before the Chicago Dental Society at the annual clinic last winter, in which this term "marble contact point" was used. The impression upon many who listened to Dr. Black's paper was that he advocated a surface like the surface of a marble, whereby the contact point sloped away in either direction in the form of a sphere. I do not believe Dr. Black intended to convey any such idea as that. What he did say was that the area of the contact point between teeth was ordinarily not any greater than when two marbles were held together. If there are any here who listened to that paper and had such an impression, I want to correct it now, because I am sure they are mistaken. I have consulted Dr. Black since he read the paper, and the impression that has generally gone out that he advocates the proximate surface of a filling to be made like the surface of a marble, is a wrong impression.

Dr. T. W. Pritchett: Bucco-lingually rather.

Dr. Johnson: Not even that. That would apply to the lower cuspid and first bicuspid, but not to molars.

Dr. Garrett Newkirk, Chicago: I am afraid a wrong impression is going to be conveyed in regard to the questions that have been asked and the discussion on this paper. This latter discussion grew out of what Dr. Johnson said with reference to exceptional

cases, where, instead of going forward and making a step to support the filling he would depend upon grooves. But that method was limited mostly to the lower bicuspids, such a one as he showed me the other day in his office where that slope would naturally occur. If those present have gotten the impression that this is a general rule with him, it is a wrong one.

Dr. JOHNSON: I am glad Dr. Newkirk has corrected such an impression. I merely referred to the occasional cases where I believe it is necessary to anchor a filling in that way without going across on the occlusal surface. There is an element of retention in making a buccal and lingual wall of that form.

Dr. EDMUND NOYES, Chicago: I hesitate to say anything which would tend in any degree to modify or indicate exceptions to the rules and statements laid down in this paper. I have had too many unpleasant experiences of failures in my practice for want of understanding and obeying these very rules. Notwithstanding that, I think that the old adage that all rules have some exceptions, holds true in regard to this also. It is very important that these scientific principles should stand clearly and definitely in our minds as the basis of all of our work, and if any exception is made to these rules, it should be with reference to just the particular thing we have got under our fingers, and for a very definite reason, just as we say sometimes that the first thing to think of in filling a tooth is to fill it with gold; if not with gold, fill it with something else for some positive reason which you can assign for not doing it with gold. These operations in bicuspids and molars are extensive; they take a good deal of time and prolonged and painful cutting to prepare the cavity, and it is a tedious operation to make a good filling. Sometimes we find proximate cavities in bicuspids and molars in children so young that it is a very serious matter whether they ought to be subjected to so severe and protracted operations, and I have felt justified myself by the results in certain cases where I have made such proximate fillings without cutting the occlusal surface at all, and the patients have had five or six years of good service out of teeth so filled, preventing the cavities from becoming deep, and I have been able to do more extensive operations when these people were old enough to endure them. This is one point that stands in my mind. There are a few instances, of incisors especially, in which the particular form and character of the teeth are such that for patients who will take scru-

pulous care of their teeth we may be justified in filling proximate cavities without cutting quite as much as to have the cervical border covered by gum tissue. I will say this, that I have had a very large and successful experience in making such fillings, and they have done excellent service and for such patients have shown no indications of failure. The same thing is true, in less frequent instances and with much more conservative care, in bicuspids and molars, many of which will be preserved permanently without extending the cavities to the gum line, or quite to the lingual or buccal wall, if the fillings go to the occlusal surface for good anchorage, and the buccal and lingual walls are some distance from the contact point. I do not want to say too much about these cases, because I have had some unpleasant experiences of failure along these lines; at the same time, I have seen enough of these operations that stayed year after year and showed no indications of failure, to make me sure there are cases which will be permanently preserved without very extensive cutting toward the cervical, or buccal and lingual walls. I speak of this phase of the subject with a little care and hesitation, because the formation of rules and plans by the essayist seems to be the most thorough, the most scientific, the most certain of success and permanence of anything that we have ever had upon this subject, and as I said in the beginning, deviations from the rule should have definite reasons in the mind of the operator who dares to deviate from them.

Dr. E. H. Allen, Freeport: I am very much interested in this subject, and I was just thinking that here we have the preparation of this class of cavities reduced to a system. We have them classified, and while in some respects radically different from the lines I have followed, and I do not expect to go home and abandon all the methods that I have used during the years I have been in practice, at the same time I see where I can change my methods in a great many respects with advantage. I never have attended a meeting of any dental society where I have heard a paper on this subject presented with so much clearness and with such good rules to guide me in the preparation of these cavities, as I have in this paper and the discussion which has followed. I feel that I am very greatly benefited by it. In a general way, in the preparation of the interproximate space and the margins of cavities, I have followed about the same way in my preparation of bicuspid and molar cavities.

Dr. J. E. Nyman, Chicago: There is one feature in connection with this extension of margins and preparation of these cavities that has not been touched upon, that is, you are exposing the dentine of the tooth, you are exposing a larger area of it than was formerly done under old methods to a foreign substance, one which is a good conductor of thermal changes. It has been my experience, and perhaps the experience of others, that patients complain a great deal of the sensitiveness of these teeth to thermal changes, because we have this increased surface of sensitive dentine exposed to a foreign body, which is a good conductor of heat. In the second place, we have an increased area of metallic surface, which intensifies the amount of thermal change according to the square of the increase of its area. It would be well in every case in which a great deal of sensitiveness is present to flow a film of oxyphosphate of zinc cement over as large a surface of the exposed dentine as possible.

Then, there is another feature, namely, shape of the cavity and the shape of the tooth ought to harmonize. The contour lines of the teeth are all curves and so should be the margins of the cavities. In the preparation of certain cavities in the anterior teeth, as Dr. Harper has suggested, grinding the step at the occlusal surface of the incisor, this gives an appearance that is objectionable to most people, and unsightly to all. I should prefer in all such cases to place my reliance on the occlusal step in the lingual wall. It is seldom that we are not able to slightly grind the incisal edge of the lower incisor which occludes on the edge of the cavity. If we can do that, the danger of forcing it out of position is so much less that the anchorage on the lingual wall will be sufficient. If it is impossible to do that, I prefer to devitalize the teeth aad put on a porcelain crown.

Dr. Geo. E. Hunt, Indianapolis: I believe that in the main the principles enunciated by the doctor in his paper are correct. But in preparing proximal cavities in the anterior teeth, I do not believe it is always necessary to cut the tooth substance below the gingival line in order to make a successful filling. I do believe that the margin of the cavity ought to be extended far enough away from the point of contact to insure a safe filling; but that does not always necessitate extending it below the gingival line. A great deal of excellent tooth substance would be sacrificed in always following that rule.

Dr. J. G. Templeton, Pittsburgh: I agree in the main with the essayist; he has given us a beautiful demonstration of his method of preparing cavities. I wish to say a word or two in reference to the remarks made by Dr. Nyman concerning thermal changes, if it is permissible. For many years I have been in the habit of drying my cavities thoroughly and of cutting away freely, so that the marginal edge would be free without any contact, so as not to have the recurrence of decay. In order to prevent thermal changes I dry my cavities thoroughly with absolute alcohol, which has a great affinity for moisture, and after drying it I use bibulous paper or spunk, then varnishing the inside of the cavity, not allowing the varnish to go to the margin. I employ a solution of sandarac in sulphuric ether. The ether evaporates readily and leaves a thin coating over the inside of the cavity. If the cavity is very deep, you can take a thin piece of asbestos felt and lay it in the floor of the cavity, put the filling over it and you will not have the effect of thermal changes.

Dr. Thomas L. Gilmer, Chicago: I wish to say a word or two which is somewhat foreign to the subject under consideration. It is with reference to the remarks made by Dr. Nyman when he spoke of using oxyphosphate as a nonconductor under fillings. I made tests, a few years ago, to discover the relative conductivity of the different filling materials, and found that oxyphosphate was nearly, if not quite as good a conductor of heat and cold as condensed gold foil, consequently it is not a very good material to employ for this purpose. I believe Dr. Black says it is not good practice to use a medicament in a cavity, after it is prepared for filling, but experience leads me to the conclusion that if I use 95 per cent carbolic acid in a cavity and coagulate in a measure the contents of the tubuli, by that means I very materially decrease the effect of thermal changes on the sensitive dentine.

Dr. A. H. Peck, Chicago: I, like the majority of the preceding speakers, feel that we are under great and lasting obligations to the essayist for this complete, scientific and magnificent exposition of the subject with which he has favored us to-night. I also agree in the main with what has been said upon the subject. There are some points, however, with which I disagree, and the most essential one was that referred to by Dr. Johnson regarding the anchorage of large proximate fillings as indicated in this cavity (illustrating). In conversation with the essayist previous

to the meeting, he told me that Dr. Black had examined his models, that he had looked carefully into the preparation of these cavities, and had stated that they conformed with his views in every particular. About two years ago I witnessed Dr. Black in his own office preparing cavities similar to these and filling them, and I must say, that his ideas regarding the preparation of such cavities have certainly changed since then, because the preparation of these margins, as he then prepared them, was altogether like the picture drawn by Dr. Johnson on the board.

This is the method which I have always practiced, and which I shall continue to practice, at least for a time, until such preparations as presented by the essayist, have had a more thorough trial, because I believe, as Dr. Johnson has said, that the force of mastication upon the filling at this point (illustrating) will be found to be so great in the majority of cavities which contain proximate fillings as to loosen them along these lines and permit of leakage at this point. I may be wrong, but I believe I am right, and as I have already remarked, until this method has been further tried, I shall continue to prepare these cavities in the manner indicated by the drawings of Dr. Johnson. And I feel that there is certainly a mistake here as to the views of Dr. Black on this point.

Regarding the transmission of thermal changes, I endorse what Dr. Gilmer has said relative to phosphate of zinc and would go a step farther. I have had this experience, and doubtless you have had the same in large compound cavities, in bicuspids and molars, that after a filling of phosphate of zinc has been placed in the cavity the patient has suffered considerable pain from thermal changes. After the cement was absolutely removed and replaced with metallic fillings, with positively no lining between the metal and dentine, the patient has suffered no inconvenience whatever.

There is one other point in which I disagree with the essayist, and that is in connection with the preparation of the cavity of this incisor. This, however, is a matter of minor importance, but it is not long since that I opened the discussion on a paper read by Dr. Johnson in one of our local societies in which this very point was involved. We then agreed—I think we will now. You will remember the essayist stated that in incisor teeth, especially those that are very thin from the labial to the lingual aspect, he would not advocate extension of the cavity as indicated here, but

would rather leave that part intact and make retention by this step farther down on the lingual surface. The idea of a step at any point is to impart strength to the filling at the incisal edge. At any rate, that is where that portion of the filling needs support, if at any point.

How is it possible to impart additional strength to this portion of the filling, if we build up extension at this point, leaving that portion of the filling to rest upon a flat even surface from that point to the incisal edge. In the teeth referred to by the essayist, it leaves a thin portion of filling material, one which is incapable of withstanding any considerable force at the incisal edge, and I believe in such cases as those failure will be the invariable result; so that instead of obtaining anchorage, as indicated by that outline, if necessary, I would go so far as to cut both labial and lingual plates of enamel and restore them with filling material, extend the cavity across and gain anchorage in that way in order to obtain proper strength.

Dr. J. G. Reid, Chicago: Referring to the preparation of cavities exhibited by Dr. Black in his clinic some two years ago, I will say that there is an old adage that a wise man changes his mind. Two years is quite a long time, and Dr. Black may have changed his mind during that time. He may have concluded that this is the correct way of preparing these cavities, and not so by the method he advocated at that time. It might be well to make this correction.

Dr. C. N. Johnson, Chicago: I cannot keep still. To-morrow or the next day at the clinic I shall show some cavities that were prepared by Dr. Black a few months ago, and then this question can be settled.

Just a word or two regarding sensitiveness to thermal changes after a filling has been inserted: Did it ever occur to any of you that this sensitiveness arises from the fact that we do not cut away enough tissue?

We have been in the habit of leaving partially decalcified dentine in the bottom of cavities through fear of approaching the pulp, and the conviction has been growing upon me of late that in doing this we often retain the very element in the cavity which causes sensitiveness to thermal changes. This infected tissue is abnormal and much more susceptible to impressions of all kinds than healthy dentine. It is irritable—we all recognize that—and I

am inclined to believe that the thorough removal of this infected tissue will result in less sensitiveness after filling. At least that has been my clinical experience. Of late years I have been cutting my cavities more freely than formerly and I have not had the same complaint of sensitiveness. The penetrating effect of decay as illustrated recently by Dr. Williams is another argument in favor of thorough cutting. Of course I should not deliberately expose a pulp when there was anything like firm dentine over it, but I think a more complete removal of infected dentine will result in diminished sensitiveness.

Dr. Ira B. Crissman, Chicago: I have watched with considerable interest the scientific demonstration of Dr. Harper, and have also listened very attentively to the remarks that have been made. In my practice I find one class of cases objectionable, namely, where the cavity extends to the occlusal surface from the labial to the lingual, including the interproximate space. We will make the assertion that it is proper to retain the filling and that we should try to get perfect adaptation of the gold to the cavity in order to get a free cleansing surface to the labial and lingual sides. We take a great deal of time in excavating a cavity and filling it, and it is perfect; but how many patients appreciate the importance of taking care of their teeth after they have been filled. We know that as the saliva courses down the buccal and lingual sides the teeth are kept clean. In my practice, I find it very perplexing sometimes to do work for certain patients. For instance, I prepare and fill a cavity of this kind for a lady, and the first thing she does is to make a hairpin receiver of her mouth, comes back and says the filling dropped out. When I asked her how it came out, she will probably tell me that it came out of its own accord or while eating soft bread. It is all right for patients to come back and complain if we are to blame on account of improper work, but it is our duty as dentists to point out the importance of taking care of their teeth after they have been filled. I know this seems of little importance, nevertheless 'tis true, for they want us to reinsert the fillings the next time free of charge, knowing they are to blame.

Dr. E. K. Blair, Waverly: I do not wish to occupy the time of the society more than a moment or two. I have in my mouth a filling that was made within the last few months. It is a large proximal gold filling in a left lower first molar. I am happy to

say that Dr. Black made it, and to-morrow you can look at it at the clinic if you wish.

Dr. J. E. Nyman, Chicago: I do not know what experiments Dr. Gilmer has made, but it is contrary to the laws of physics to say that any cement is as good a thermal conductor as a metallic substance. It has been demonstrated clinically by the majority of the profession that oxyphosphate in a cavity does not transmit thermal changes appreciably; whether this is because of a break in the homogeneity of the mass of the filling material or not, I cannot say. I am certain that it is a very good protector against thermal changes.

In regard to varnishing cavities, very often in introducing pellets of gold you rub the varnish off of the dentine before you get the filling in. It rubs off in a kind of powder, a large part of it falls out of the cavity, the rest of it on the surface of your gold and spoils its cohesiveness.

Dr. Johnson spoke of leaving infected material in cavities, and its causing sensitiveness to thermal changes and further decay. As I understand it, the paper did not refer to this phase of the question, but merely to an extension of the cavity in sound dentine for the purpose of preventing recurrence of decay; but I know perfectly well that some years ago the doctor advised leaving a portion of infected dentine in certain parts of the cavity, after having thoroughly disinfected it with antiseptics, in order to protect the pulp from thermal changes. I repeat, you are increasing the amount of metal in the tooth, consequently you are intensifying the amount of heat which would be conducted to the dentine of the tooth; and you must make some provision to prevent constant shock and ultimate death of the pulp.

Dr. E. K. Blair, Waverly: I meant to have spoken of one point when I was talking a short time ago, and it is this: I think the case in my mouth is a typical one. It illustrates what Dr. Harper has been talking about. It is the question of contact, of shape of these proximal cavities, and cutting a square seat for anchorage. It shows the proper filling of teeth in relation to the excursions of food. My mouth presents a good example. Dr. Black did not give me any great amount of pain in working on my tooth, and it was only sensitive to thermal changes for a few days. After a short time the tooth dropped back into its proper position, and from that day to this I have not had any trouble with a single

bit of meat fiber between these teeth, and this tooth is scarcely susceptible to thermal changes. I looked at the operation with a glass as he did the work. It is my impression that he cut longitudinal grooves but slightly in the buccal and lingual walls.

Dr. R. N. Lawrance, Lincoln: My impression of Dr. Black's theory is that it is good, safe and conservative practice to cut away these margins until they are free from contact.

Dr. Harper (closing the discussion): It is quite possible that the point referred to by Dr. Johnson, that of squaring the dentine in the buccal and lingual wall is correct, although I distinctly recollect Dr. Black stated that he left the buccal and lingual walls as shown in the model. He said that he was in the habit of making a slight undercut in the dentine of the buccal and lingual walls near the gingival wall, but he stated distinctly that this was to facilitate the starting and building of the gold in filling and not for the retention of the filling. These undercuts as shown in the model were put in at his suggestion, although they may not be just as he would like them. It was only a month ago that he made these statements.

I certainly advocate the squaring up of these walls as Dr. Johnson has stated, in a few exceptional cases, as in the lower first bicuspid. In this tooth there is practically no lingual cusp, and the occlusal surface on the lingual side is very much reduced in size so that a step of sufficient depth and width could not be located on the occlusal surface, thus we are compelled to resort to retention in the seat and buccal and lingual walls by squaring out to the limit consistent with the strength of these walls.

In this paper it was intended to give general rules, although I recognized these exceptional cases, but thought they could be better considered under a separate title, as they in themselves would make a lengthy paper, and I did not want the exceptional case to be confounded with the general rules. (Here Dr. Harper replied to all of the points of criticism by referring to his various diagrams and models.)

THE DIFFUSIBILITY OF COAGULANTS IN DENTINE.

By E. Lawley York, D. D. S., Chicago, Ill.

Having been many years engaged in the study of the chemistry of therapeutics, I have naturally been attracted to the articles by distinguished men published in our journals within the special field of our profession; and what I am now to present to you is based upon a careful study of the subject, together with the results of a long series of experiments, made by myself and then reviewed by others eminently qualified to criticise my efforts and to express an opinion as to their accuracy.

These experiments were made in various ways to show that carbolic acid will diffuse through dentine, in freshly extracted teeth that at the time of extraction were normal, also in teeth freshly extracted that had putrescent pulp canals; in the latter I found that there was slightly more rapidity of diffusion.

My first experiments consisted in taking a freshly extracted tooth, either having a normal pulp or a putrescent one; my experiments have been equally divided between the two classes.

After opening into the pulp chamber from the lingual or coronal aspect, according to the tooth that I was treating, and after gaining sufficient room to pass a hypodermic needle into the pulp chamber, thus avoiding cutting away the tooth structure unnecessarily, I removed the pulp, dried the canal or canals, as the case might be, and sealed the foramen at the apex with gutta-percha. I then injected a small quantity of a 95 per cent solution of carbolic acid, which had been previously colored with a minute quantity of fuchsin, sufficient to fill the pulp chamber and about two-thirds of the canal, thus avoiding any oozing out upon sealing the crown with gutta-percha. I then wrapped the teeth in wet gauze and placed them in a receptacle I had made that would keep them at about 98° F. My aim through my experiments has been to make them as nearly as possible under the same conditions that are met with in the mouth.

The earlier experiments were generally with teeth left in the

incubator twenty-four hours at least, but later I found that carbolic acid would pass through the dentine as far as the cementum in eighteen and one-half hours.

On taking them out of the incubator I made cross sections to preserve the bulk of the tooth for reference. In making a longitudinal section the tooth would be spoiled and only the section left; so that I should not have been able to show you the remaining portion from which the section was made. These were all mounted in Canada balsam, and show that the colored carbolic acid has passed entirely through the dentine. A vast number of these experiments were made with universal and satisfactory results; but to insure obtaining indisputable evidence, I commenced some other experiments in an entirely different way, which to my knowledge have never been attempted before. I will not weary you by repeating the manner in which the teeth were opened, pulps removed or canals cleaned; suffice it to say that the same mode of operation was observed in all my preliminary preparations of the tooth.

The next series of experiments consisted in placing in the canals and pulp chamber as much carbolic acid as would be used in the ordinary treatment of a tooth. After sealing the teeth I placed them in a bag that was tied to the nozzle of a faucet, and water was allowed to flow over them for two or three hours. The cementum was then ground off on two sides of the root, washed again, and the teeth suspended in water nearly up to their anatomical necks. The earlier ones I usually left twenty-four hours, but later I found that eighteen and one-half hours was sufficient time to detect carbolic acid in the water with the bromine water test.

In some cases I coated the whole of the tooth with sandarac varnish to prevent the possibility of any carbolic acid coming in contact with the tooth structure. Out of the many hundred tests made I did not fail in a single case to detect carbolic acid in the water.

To make sure that I was doing this as carefully as possible, I requested my friend, Dr. J. G. Reid, to seal carbolic acid in some teeth. This he kindly consented to do. The results were just the same. I might also add here that the same gentleman has witnessed a great number of my experiments, and can vouch for the care I bestowed upon them to make one and all reliable. As

a control test for the above I made two glass tubes to resemble teeth, as you will see (here shows examples). Dr. J. G. Reid sealed one, and I the other. These have been placed in water indefinitely, with no reaction with bromine water. You will also notice that I have not even coated these with shellac varnish.

Later on, at the suggestion of Dr. P. J. Kester, I selected sound teeth whenever I could, and opened from the apex, slightly enlarging the foramen, and passing the carbolic acid in this way into the pulp chamber, then sealing and coating with sandarac varnish, washing, etc. I suspended the tooth in water, crown down, thus excluding any possibility of leakage. The results are just the same—carbolic acid in the water.

It is not necessary for me to give any more examples, for as I have already stated, the results were the same in every case.

The following experiment was intended to demonstrate that carbolic acid does not form an impenetrable coagulum at the orificial end of the dentinal tubuli, with their albuminoid contents.

A tooth was taken that had contained a 95 per cent solution of carbolic acid in the pulp chamber and canals for seventy hours. The canal was dried, and a saturated solution of sodium chloride was inserted by means of a hypodermic syringe. The end was sealed with gutta-percha and then coated with sandarac varnish. This was allowed to dry, after which it was washed one hour with water. The tooth, which had only been opened at the apex, was suspended in water, crown down, about two-thirds of its length being immersed. In three hours I tested the water with a drop of a 25 per cent solution of argent. nitras, which resulted in large quantities of the chloride of silver being thrown down, thus proving beyond a doubt that the coagulum formed by carbolic acid is not a barrier to the passage of other substances through the dentine, as has been so often stated.

TEST FOR DIFFUSION IN COAGULATED ALBUMEN.

I took a hard boiled egg, sawed off one end, carefully removing first the yolk and then the remainder of the shell, placing the rest in a small wine-glass containing about one and one-half teaspoonfuls of water. I then poured in the space previously occupied by the yolk some carbolic acid. This was left for twenty-four hours, with the assurance from those who saw it that carbolic acid would never penetrate it. When I tested the water it was

so loaded with carbolic acid that I had to pour it into a larger vessel to accommodate the quantity of bromine water required.

The next time I made this test I found carbolic acid would pass through in two hours.

A pulp which is in a congested or hyperæmic condition, as the result of blows, exposure, thermometrical changes, ingress of microörganisms, etc., is especially liable to disturbances resulting from blood stasis, owing to vessels both entering and leaving the same narrow foramen, consequently the pulp is in all probability subject to strangulation or stasis. The changes that now take place are not chiefly inflammatory, but necrotic followed by secondary decomposition and putrefaction.

Here we have to do with the death of tissue occurring under special conditions, and resulting in the formation of coagulated albuminoids; but the coagulation takes place, not in a liquid, but in the substance of formed tissue elements, in cells and cellular or intercellular structures. If by reason of arrested nutrition, or by the action of chemical or thermal agencies, a definite segment of an organ undergoes death, this gives rise to coagulation within the tissue for the reason that the lymph contains fibrinogen, the cells contain fibrinoplastin, and from these substances fibrin is produced. Hence Cohnheim introduced the word coagulation necrosis* to describe this special form of local death, viz., necrosis with fibrin formation.

Coagulation necrosis may also be found combined with other retrogressive changes, such as fatty degeneration.

What we are in the habit of speaking of as ulceration is not true ulceration in a pathological sense, but in its incipiency at least, coagulation necrosis.

With this array of facts staring us in the face, what course of treatment are we to pursue? Nature is forming a coagulum. Should we not attempt to assist her by hurrying artificially those changes which she will in time produce spontaneously?

The late Professor Heitzman, of New York, says in the discussion of a paper read by Dr. A. W. Harlan before the First and Second District Dental Societies of the State of New York, January 8, 1895:

"Look at the canaliculi with a microscope after the coagulant

*Ziegler. Text-book of Pathological Anatomy. Art. 36, page 65.

has been applied. They have kept their shape, but the tenants, the threads of living matter, are shrunken and dry. Do you suppose that this dry material within the canaliculi is a fit pabulum for the infectious material? No.

"Again. If mischief arises, after a filling in the sense of Dr. Harlan, it is not the material as such that is to be blamed, but it is a mistake in the filling."

The cause, in my opinion, of so-called lame teeth, and it is also the clinical experience of a large majority of the best men in the profession, is imperfect root filling, not the use of coagulants. We so often see pulpless teeth in the mouths of our patients, without any root filling, when the whole crown is decayed away and the pulp chamber and canals are reeking with purulent matter. The patient will reply upon inquiry that the tooth has never given any inconvenience. This condition can only be accounted for in one way, namely, that the foramen is obliterated or closed—encysted if you like, consequently none of the septic matter can pass through the foramen and set up irritation and consequent inflammation of the peridental membrane.

I do not think there ever was a so-called lame tooth caused by the septic matter contained in the canal or canals of a tooth passing through the dentine and cementum, and setting up irritation and inflammation of the peridental membrane. It must pass through the apical foramen to cause such a condition.

Dr. Harlan, in a paper read before the Iowa Dental Society says: Carbolic acid melted was introduced into the pulp chamber very carefully, to avoid getting any of the acid in the crowns or on the outside of them. After the lapse of twenty-four or forty-eight hours, respectively, iodine tincture was introduced in the same manner as first described above.

"If the iodine penetrated the dentine, it would pass through the cementum" and turn the starch blue. It did not penetrate, hence no blue stain.

Iodine is soluble in carbolic acid; carbolic acid is soluble in alcohol; both are coagulants. Carbolic acid is sparingly soluble in water, iodine is soluble in water 1 to 7,000 parts. "This is one of the best experiments that could be used as a test for diffusion."

Another series of experiments was made with the tincture of iodine alone. The results were negative.

To test the value of this experiment I ground a tooth and

placed it in a bottle containing water. I took a small quantity, to which was added a drop of Lugol's solution of iodine. A few drops of the mixture were tested with dilute starch paste with no consequent reaction.

This was precisely the same test that Dr. Harlan made, with the exception that the teeth in his case were intact.

The reason there was no reaction was that the tinc. iodine combined with the salts of the tooth, and formed iodides of the base with which it united, leaving no free iodine. Consequently we could not get the reaction of the iodine.

Control test for the above.

The same starch paste, with $\frac{1}{10}$ the quantity of iodine and water, gave the blue iodide of starch very distinct.

The majority of the teeth used in my experiments were kindly supplied me by Dr. L. W. Nevius, a specialist in the extraction of teeth with nitrous oxide gas.

I desire herewith to acknowledge my grateful appreciation of the courteous assistance of the scientific gentlemen who have placed their laboratories and scientific apparatus at my disposal, and have contributed to my knowledge of the subject herewith presented.

Dr. Walter S. Haines, and his assistant, Mr. Riberg, of the Rush Chemical Laboratory; Dr. J. M. Dodson, Professor of Physiology, Rush Medical College; Dr. Le Count of the Pathological Laboratory, Rush Medical College; Dr. Weaver of the Bacteriological Laboratory, Rush Medical College; and Dr. J. G. Reid.

DISCUSSION.

Dr J. E. Hinkins, Chicago: Dr. York was kind enough to present me with a copy of his paper two or three weeks ago.

After a careful study of this paper when it was handed me to read by the essayist, it pleased me very much indeed, with the originality of the work and the scientific manner in which he carried on his investigation. I was inclined to agree with Dr. Harlan's views until I read Dr. Kirk's paper two years ago, in which he brought out some scientific points quite plainly in behalf of the coagulators of albumen. And then following his paper came Dr. Truman's paper with his numberless experiments showing and illustrating that they did penetrate dentinal tubuli, and from my own clinical experience, I began to draw my conclusions accordingly, from the

best results obtained from the two different classes of remedies, and noting the results of each, have come to the conclusion that coagulants are not self-limiting.

After reading Dr. York's paper carefully and then going to his office and watching him make all of the experiments, using the utmost care in every detail to be sure that he had made no mistake, I must confess I was surprised to see the chemical results which followed every experiment he made.

The manner in which the sections were made with carbolic acid and fuchsin is conclusive in itself that carbolic acid does penetrate the dentinal tubuli. Whether or not the fuchsin aids the carbolic acid in its diffusibility I cannot say, but here come the other experiments still stronger than ever. Here are teeth that have no cavities in them at all, the pulp extracted from the foramen and sealed perfectly with gutta-percha and washed in running water for hours and then suspended in water with their crowns downward and we see that carbolic acid does diffuse through the dentinal tubuli, and when he adds the bromine water you have seen the precipitate that it throws down.

We have been taught that the coagulators form an insoluble albuminate, but as we follow these experiments we come to where he has put sodium chloride in teeth where he has previously had carbolic acid for seventy hours, seals the teeth with gutta-percha and then suspends them in water as before. In less than three hours he adds nitrate of silver to the water and gets a very decided reaction of chloride of silver. It seems from the experiment that the carbolic acid had opened the tubuli instead of closing them up.

I have experimented on four teeth, one a perfect tooth just extracted, the other three had been extracted for some time. On the freshly extracted tooth I obtained the same result as Dr. York, testing for carbolic acid at ten and fifteen hours, no trace. At twenty hours found carbolic acid. The silver test was a decided success in this case, the three teeth having been extracted for some time. Found carbolic acid after sixty hours.

Now, gentlemen, these reactions are chemical facts and no guess work about it. They either combine specifically or they do not combine at all.

The egg test stands for itself. I have made this experiment and have obtained precisely the same results as the essayist has

and I firmly believe any one else can obtain the same results if he conducts the same experiments on chemical principles.

The glass tubes demonstrate beyond doubt that the sealing was perfectly done as you have seen. There has not been the slightest sign of carbolic acid in the water where they have been for weeks and have been tested frequently.

The pathological part of this paper is an extremely important one and I must frankly confess that I am not competent to discuss this part of the paper as it should be.

Although I have lost no time since I first read the paper to obtain the scientific facts and to try and ascertain if possible what the real pathological conditions might be in a congested pulp whether or not it was due to the pathogenic microbes and the breaking down of the liquids and producing a putrescent pulp and then death, or was the death of the pulp caused by the formed substance of tissue elements in the cell and cellular structures, is the question I cannot answer from my own knowledge. But I have been taught from such men as Profs. Klebs and Stanger, Ziegler, Walsh and other prominent writers, that death was due to the chemical changes of the cell and cellular structures which would result in the death of the pulp or coagulative necrosis.

I shall quote Ziegler and leave the subject to you:

"A. Schmidt, in his work on the blood, published in 1892, wherein he collects the results of many years of study on coagulation regards the fibrin ferment or 'thrombin' under the influence of certain zymoplastic substances. In the same way he regards the fibrinogenous substance, or metaglobulin, as a product of the disintegration of cellular protoplasm. If this view be correct, and if investigations of Wlassow find further corroboration, then the generators of coagulation, as well as those of thrombosis, must all be regarded as cellular derivatives, and it would then be particularly the red blood corpuscles which would be the source of the materials of coagulation.

"According to Corin, coagulation occurs in the blood after death only when the blood already contained ferment during life; and the extent of the coagulation is directly proportional to the amount of ferment present at the time of death. A further production of ferment does not occur after death; on the contrary, the vessel walls probably constitute a body inhibiting coagulation. Between the blood of those who have died suddenly (cases

of strangulation) and that of those who have died more slowly, the difference is only relative, depending upon the amount of ferment present. No value can therefore be ascribed to the fluidity of the blood in the diagnosis of the mode of death.

"When exudate is present in a tissue, it may be absorbed in part by the tissue elements themselves, so that they swell up and not rarely contain drops of fluid, which are ordinarily called vacuoles. There often occurs also, a complete dissolution of the tissue elements in the exudate, especially of the connective tissue cells, and not seldom also of the intercellular substance. In this way both brain and muscle tissue, as well as ordinary connective tissue, may be completely liquefied in the course of an inflammation.

"If dead cells become saturated with lymph containing fibrinogen, and fibrin ferment is formed, a coagulation may precede the liquefaction of the infiltrated tissue, in which case the cells are transformed partly into homogeneous masses without nuclei, and partly into granules and filaments."

The cause of the so-called lame teeth in my own clinical experience has taught me to believe absolutely that imperfect root filling is the principal cause of these neuralgic troubles, and not septic matter stored up in the dentinal tubuli and cementum, setting up an inflammation of the peridental membrane. After it has been treated with coagulants, it must pass out the root canal and through the apical foramen to produce these conditions.

After reading Dr. York's paper with me Dr. G. W. Cook thought he might test the antiseptic properties of carbolic acid by sealing the teeth up as suggested by Dr. York, and making plate cultures of the anthrax bacilli and plating out Nos. 1, 2 and 3, placing the tooth with carbolic acid in it in Plate No. 2 and carrying this experiment on with eight teeth, getting no growth in Plate No. 2 in which the tooth was; while on Plates No. 1 and 3 the colonies appeared in great numbers. After this he selected ten more teeth preparing in the same manner and making cultures of typhoid and hay bacillus and getting growths as before on three out of ten. To be sure there was no difficulty in sealing the teeth, he took a glass tube and placed in it about three minims of carbolic acid and sealed it as in the case of the teeth, placing it in Plate No. 2. In this case there were plenty of growths right up

around the ends of the tubes. Every detail of these experiments has been carried on under perfect bacteriological methods.

He does not consider this report anything like complete, but it goes to show very conclusively that carbolic acid is an antiseptic even through the cementum of the tooth, and Dr. Cook hopes to carry this work to a more definite conclusion.

Dr. A. W. HARLAN, Chicago: I have listened to the paper that has just been read and I have watched the experiments, and, I may say, that up to the time of coming into this room and hearing the paper read and seeing the experiments, I had no knowledge of the work that had been engaged in other than what was afforded by the program. It is hardly possible for me offhand to take up the whole of his paper and discuss it at once, but I want to say that the last and most conclusive test that Dr. York submitted to us is the faultiest one of the lot, the one with reference to the placing of carbolic acid in half of a boiled egg, then testing the water later. To my mind that test is inconclusive, for the reason that bromine water itself would produce a similar appearance without the presence of carbolic acid at all. Furthermore, in the specimens that were sent around, the pale yellow precipitate, which is characteristic of the bromine test, was not present. The very best chemists state that bromine water will distinguish about 1-265,000th part of phenol in a solution. I will take Bloxam as my authority. The bromine test is stated to be one of the best qualitative and quantitative tests for phenol that we have. I have in my hand two specimens that are but ten days old, that have contained 95 per cent carbolic acid. The pulp was taken from a freshly extracted tooth May 1, 1897, and the root of this tooth was hermetically sealed and 95 per cent carbolic acid was added to it, and if it has gone through into the plaster of Paris, when that has broken up, it will show the same reaction that Dr. York's tests have.*

Dr. YORK: Yes, if they have been kept under the same conditions that my tests have. If kept in dry plaster, it would not get that. That is not the same condition we have in the mouth.

Dr. HARLAN (continuing): I have also two teeth that were treated in a similar way; they were filled with a solution of nitrate of silver, from 50 to 75 per cent. If the nitrate of silver has passed through into the plaster of Paris, we will determine later

*No reaction after sixteen days [A. W. HARLAN, July, 1897.]

this afternoon by testing it a little. I only brought these with me, because I did not know what the character of the paper was to be, or what it was to deal with. It will show that nitrate of silver can easily be detected by a number of tests that are sufficiently plain for any one to see. As a rule, the test of Dr. York is absolutely inconclusive, for the reason that you cannot manufacture iodide of lime in the presence of magnesium and fluorin and other inorganic constituents of the tooth. Lugol's solution, or any other solution of iodine, in the presence of another coagulator, if you keep on adding it, would ultimately pass through and stain a tooth so that the characteristic blue reaction would take place. I am not here to repudiate the testimony and the experiments that have been made, extending over a long period; but, it seems to me, that the experiments, while very careful and ingenious, do not prove that in the mouth of the individual the same thing would take place. In talking to Dr. Black on this subject recently, he said that the thing lacking in all of these experiments was the restraining influence of the vital fluids and the surroundings which had a tendency to render the effects of the coagulating agent null and void. Now, if you take nitrate of silver, which is an excellent coagulating agent, and place it in a tooth in the mouth, and leave it there and afterward extract the tooth, you do not find it is blackened up to the cementum, because I have extracted such teeth. How long it takes to accomplish that, I do not know; but when nitrate of silver is brought in contact with organic matter it precipitates the free silver and on exposure to light or sunlight or a diffused light, the substance with which it has been brought in contact turns black. If one of the powerful coagulating agents in a tooth *in situ* has failed to pass through the dentine, I do not know how it would be possible for us to prove that carbolic acid would pass through dentine in the jaw, although perhaps some means will be determined to prove that.

The experiment with reference to the treatment of a tooth with carbolic acid and afterward with sodium chloride, I do not know just what reaction would take place between sodium chloride and carbolic acid. If any of the sodium chloride passes through it would be easy to recover it. Sodium chloride is not a medicinal agent, and I would not consider that this was a test of what is meant by a barrier to the diffusion of other medicinal agents. You take a tooth and seal the foramen and treat it with 95 per cent

carbolic acid and leave it twenty-four, forty-eight, sixty or seventy hours, and introduce a solution of sodium chloride and suspend it in water, and then test for the precipitate of chloride of silver, I would hardly consider that this would be analogous to the situation of a tooth in the mouth, and I would not consider it to be conclusive when another medicinal agent was not barred from passing through the tooth.

I am sorry I did not have an opportunity of reading this paper and preparing myself for a more interesting discussion of it; but I shall take the opportunity to repeat a great many of these experiments myself, and if it shall be proven that the coagulating agents are not barriers to the diffusion of other medicinal agents, I shall simply take off my hat to any gentleman who proves it. (Applause.)

Dr. J. G. Reid, Chicago: I have very little to say in connection with this subject. I have read the literature of it a great deal, and I am very much interested in it. We have this question to settle. It must and will be settled conclusively to every one in the not distant future. We will be able to say whether these agents are self-limiting or whether they are not. We are getting very close to it. The experiments which have been conducted so far on both sides, I cannot take issue with; I cannot oppose either one side or the other. Personally, I have not investigated this matter by experiments. I have observed and seen the results that other men have demonstrated, and from these results I draw my conclusions. I believe that my clinical experience is worth something to me. I believe that my observation as a dentist, who tries to observe and learn from what he sees, is of benefit to me. We have all used carbolic acid for many years, many of you for thirty or forty years, and have had good results from it, and still continue its use. The father of antiseptic surgery has returned to his first love. I refer to Sir Joseph Lister. He was practically the first one who introduced antiseptic surgery, made it generally known, and has within the last four years made the statement that carbolic acid is par excellence as an agent in antiseptic surgery. All of us have used carbolic acid in the treatment of pulpless teeth. Understand me, I do not wish to convey the impression that this agent is the very best that can be used in pulpless teeth; carefully conducted experiments prove the contrary; there are other agents far more potent for this purpose.

With reference to the experiments that have been conducted, showing the diffusion of noncoagulating agents, while I believe they are thorough in the true sense of the word, and I am willing to accept the results, I am not willing to believe that some of the coagulating agents do not and will not diffuse through the dentine.

Dr. A. H. Peck, Chicago: The question under discussion, as I understand it, is not whether carbolic acid is a thorough, safe antiseptic to tie to, but simply as to whether or not it will pass through the dentine of a tooth; whether or not it is a so-called self-limiting coagulant. As to its antiseptic properties, I think we shall be able to clear that up satisfactorily a little farther on.

First, I want to say to the members that I consider the work done by Dr. York along these lines the very best work that has been done in this connection. (Applause.) I consider Dr. York's series of experiments freer from faults than those of any one else of which I have any knowledge. I know that he has exercised the utmost care in carrying out every detail of this work. It seems to me, that the manner in which he has gone about this work ought to convince all of us who are fair minded, that the results he has arrived at are conclusive.

I wish to say also that within the past two or three weeks I have done considerable work in this same line myself, in an experimental way. Dr. York knew nothing about this, as I said nothing about it to any one, and knowing the methods which he has adopted in carrying out this work, I have done my work as far as I have gone with it in the same manner, because I was unable to work out any other method which would seem to be more complete or safer to adopt. My results, so far, coincide with Dr. York's exactly.

Regarding the antiseptic properties of carbolic acid, in connection with my college work during the past winter, and in conjunction with Professor Black, I made as complete a series of experiments as possible with the various essential oils and other agents ordinarily used in dental practice, with a view to determining their relative worth or potency as antiseptics. The manner in which we went about the work is this: Taking test tubes with sterilized broth, each one containing on an average 8 cc., this broth was infected with saliva from various members of the class, into which a certain quantity of the agents being used for experimentation was placed. For instance, after one tube had been in-

fected, one drop of oil of cassia was placed in the tube; this in turn was placed in an incubator, and observation of the results was carried on for a period of three days in connection with each of the plants made; and altogether we made something over 200 different plants in order to arrive at the results which we did. In relation to carbolic acid, a 95 per cent solution was used. We first made a plant with one drop. The growth was restrained for a time; at the end of the first twenty-four hours more or less bacteria developed. At the end of the second day, with one drop, there was a very great amount of growth, seemingly as much as appeared in the control tube, and the control tube was the one into which no antiseptic agent was placed; and in connection with each set of plants made a control tube was used, and invariably presented unlimited growth; hence there can be no doubt as to the accuracy of these experiments. I increased the carbolic acid up to 3 drops, and this restrained the growth in the tube until the end of the third day; after that growth set in, and there was more or less development of bacteria. We made a plant of 5 drops, and this restrained the growth for a little longer period. We continued this work until we decided that carbolic acid is not a safe, thorough, permanent antiseptic to use, that is, purely as an antiseptic. It has the peculiar property of restraining the development of bacteria for a time, but after a few days have elapsed it seems to lose that power, and the development of bacteria goes on just about the same as if no antiseptic were present.

A MEMBER: What was the result of oil of cassia?

Dr. PECK: One drop prevented growth.

Dr. J. W. WASSALL, Chicago: This is a question of very great interest and I suppose there are few members here who have not read almost all the articles that have been written on the subject. The experiments of Dr. York have apparently been more scientifically carried out than any that have heretofore been made, and a great many present to-day seem to be convinced of the truth of the position he has taken. However, the question is not yet definitely decided, judging from the way Dr. Harlan speaks. The cases he exhibited just now show that he has conducted similar experiments, and it would be interesting to know whether he finds traces of carbolic acid in the plaster surrounding these teeth. The practical phase of this subject is whether carbolic acid is a good disinfectant. This question was raised by the essayist, and even

if it is a good disinfectant, is there not a better disinfectant? It would seem to me from the investigations of Dr. Harlan that carbolic acid is a very poor disinfectant for this purpose; it would also seem so from what Dr. York has told us. What is the condition we find when we have used carbolic acid in a putrescent root? We have coagulated matter which remains in the tubuli. This matter is coagulated and for a time it remains innocuous and is no longer poisonous to the tissues for the time being; but, as Dr. Peck has explained, this harmlessness does not last for a great length of time. You have all removed canal fillings that have been in the teeth for a number of years, and yet the odor of carbolic acid which was first used in these roots, has disappeared entirely. This also occurs in the tubuli of teeth where the roots have been filled and previously sterilized with carbolic acid. The carbolic acid finally disappears, leaving this coagulated matter in a condition where it can act as an irritant to the cementum. Here, at this point, I differ with Dr. York as to lame teeth. I have observed a great many lame teeth where there was no evidence of irritation at the apex of the root, where there was no fistulous opening, but there seemed to be a general lameness of the tooth in its socket. Such cases are relieved by opening up the teeth, removing the old canal filling which may be there, and thoroughly disinfecting the whole zone of dentine, which will be found to be polluted by septic matter. In such cases you will get very little or no discharge. You will find no moisture at the apex of the tooth, but you will find the dressing which is taken out of the tooth generally stained. I now wish to say a few words relative to the comparative value of the volatile oils and carbolic acid. I have spoken of the disadvantages of carbolic acid, and now wish to say a word about the use of volatile oils in the root canal, the dentine of which is polluted with putrefied organic matter, meaning by this the putrefied dentinal fibers. The treatment of such a root with volatile oils is more efficacious, because at the time you take out the dressing, which has been placed in the root for twenty-four hours, you will find there is a stain upon the dressing. This stain is the putrescent matter which has been extracted from the dentinal tubules. The volatile oil has acted as a solvent for this matter in the tubules and has withdrawn it, and of course the proper treatment is to keep on making dressings of volatile oil until no more stain is observed on the dressings. If you used carbolic acid you would

coagulate the contents of the tubules; therefore, you could not extract this putrescent matter from it.

Dr. Lowry, of Kansas City: Dr. Reid seems to have struck the keynote when he said that carbolic acid was the chief antiseptic, as stated by Sir Joseph Lister, and I agree with Lister on the subject. Carbolic acid, as we know, is a strong coagulant, and coagulation checks infiltration. Whenever you introduce it into the root of a tooth it coagulates the protoplasm of the tubuli and prevents infiltration or penetration. You have not in it therefore the beneficial results that you would have with some agent that is more penetrating or diffusing.

I doubt very much whether the experiments conducted by the gentleman who read the paper will prove reliable tests. The moment you extract a tooth, you take from it a certain degree of moisture or coagulative matter which does not resist the penetrating influence of the carbolic acid like it would in the mouth. There is a continual throwing off of serum from the peridental membrane through the cementum and into the dentinal tubuli which would resist the penetrating influence of the carbolic acid. Therefore, I think these tests conducted out of the mouth are not as reliable as those conducted in the mouth, if it were possible to conduct such tests.

Dr. Truman W. Brophy, Chicago: Perhaps I would not have arisen to say anything upon this subject had I not been prompted to do so by the remarks of our friend in the rear of the house. He has made a statement here, which I think should be challenged regarding the application of some of the essential oils to the roots or canals of teeth. My friend Wassall made the same statement. I want to go on record, Mr. President, as saying that certain essential oils should never be applied to the canals of teeth. They are a positive injury to the teeth and to the surrounding tissue. Oil of cassia is one; there may be others. Clinical experience has proven beyond a question of doubt that oil of cassia is a substance which should never be put into the canal of a tooth.

Dr. Cushing: Why?

Dr. Brophy: Because it will penetrate not only every particle of the tooth structure and the organic matter contained therein, but it will penetrate every portion of the inorganic matter of the tooth, except the enamel, and pass through into the pericementum

and produce pericementitis. It is true that carbolic acid will not penetrate through the dentine into the cementum. Proofs have been offered and experiments have been made repeatedly to show that carbolic acid will not pass through the dentine into the cementum. It has never been done I think. If any one can prove carbolic acid has ever penetrated through the dentine into the cementum, and if any one here can show me that it will go through the dentine of a tooth and pass through the cementum to the pericementum, I shall be glad to see him do it. If he cannot do it now let him come before the society next year and prove it if he can. He cannot do it. It cannot be done. It may seem a little ridiculous to make such a positive statement without having conducted experiments along this line, but the experiment we have had to-day will convince any reasonable person that my statements are true.

I want the gentlemen who may think I am wrong to prove it next year by experiments, and I will do as my friend Harlan said, take off my hat as soon as they do it. But no one has been able to do it yet. This question bearing upon the therapeutics of carbolic acid is one that will never disappear from the literature of our profession. In 1882 I came before this society and read a paper entitled "Carbolic Acid and Creosote, Their Therapeutical Application to the Practice of Dentistry," and on that occasion I proved to many of my friends, who claimed that creosote was an agent that would absolutely not injure the dentinal pulp, and that it should be used in preference to carbolic acid and was in every sense more desirable as a therapeutical agent than carbolic acid, that creosote was only carbolic acid of a crude kind. I obtained twenty-five samples of creosote from as many different drug stores in the city of Chicago, tested them, and found there was only one specimen that approached anything like creosote; all the rest of them were carbolic acid, yet we have been deceived into the belief that creosote was so much better than carbolic acid. We are all using carbolic acid substituted by druggists for creosote.

There is a great deal to be said on dental therapeutics. There are men in this room who have been practicing dentistry longer than forty years, and have been using carbolic acid and creosote during that period of time. They have been treating pulp canals with it; they have been treating fistulous openings leading from alveolar abscesses; they have pumped it through these openings

for a period of twenty-five years and have cured those cases unless they were complicated by diseased bone, and yet they now claim with other people that carbolic acid is a bad thing to put in the canal of a tooth. This is the question at issue to-day, is it an agent that will do harm? These patients got well twenty-five years ago; the fistulous openings healed. In those days, when they had no flexible fillings they filled canals with gold and consequently the work was imperfectly done. These flexible root canal fillings adapt themselves to the different conformations of the canal. Some practitioners have pretty nearly abandoned the use of carbolic acid. I mean, now and then, you will see a dentist who uses it and his patients get along just as well, and perhaps better. Others use other agents. These questions are of interest to us and will be, and now that the question has gotten to a point of importance, has reached the jumping off place, it has got to be settled. It is like treating exposed pulps. This was a question which occupied everybody's mind twenty years ago, but it is not discussed so much now. The profession have different views about these things. When a pulp is in a state of inflammation it is the end of it, and whoever tries to save it is going to get himself into trouble and his patient more. Of course, there are some exceptions.

I am glad Dr. York has read this valuable paper to the society. It is an excellent contribution to the literature of the subject. It stimulates us all to take hope, and those whose views are not in accord with those presented in the paper will be stimulated to take this matter up and prove that their positions are correct if they can

Dr. C. N. Johnson, Chicago: I wish to correct one impression Dr. Brophy seems to have made. He made the statement that carbolic acid would not penetrate dentine. He did not mean to imply that, and I fear many of the members got the impression from the statement that carbolic acid would not penetrate into the dentine to the cementum. According to the experiments, carbolic acid does penetrate through the dentine to the cementum, but it goes no farther.

One word before I sit down, in commending the essayist for the line of work he has been engaged in, and the manner in which he has prosecuted that work. I wish to modify a little some remarks I made in discussing the president's address. I made the statement that I was in great fear that the tendency among

our young men was not toward original investigation to the extent that it was among the men of previous decades. I think this meeting has very nearly demonstrated that I was in error, and I want to take it back. (Applause.) I am not familiar with the subject under discussion. I have not made any experiments along this line, but I look at it from the point of view of a general practitioner. What we want to get at is the truth; and I feel sure from my personal acquaintance with the gentlemen who take opposite views that when the truth has been conclusively proven there will be a general shaking of hands, and a rejoicing all around.

Dr. Truman W. Brophy, Chicago: I am glad to hear Dr. Johnson's correction of my remarks. I did not intend to convey the impression that carbolic acid would not penetrate through the dentine. If I remember rightly, I said that it would not penetrate through the dentine and also through the cementum, or from the dentine through the cementum. Of course, it will penetrate through the dentine, go to the cementum, and there it will stop. Oil of cassia will go through it all, and it will not only do this, but it will discolor the tooth, and for that reason it should never be applied to a tooth canal. Carbolic acid will go through the dentine to the cementum and there it will stop, but it will never go through the pericementum and produce pericementitis.

Dr. J. E. Hinkins, Chicago: I want to say a few words more on this very important subject, and first to commend the work of the young men in the profession. I firmly believe that the time has come when we as a profession should know more about the pathology of dentistry. We are exceedingly lame in this regard. I am sorry to have to admit I do not know of one man in the dental profession who is competent as a pathologist to take the different kinds of pus that we have to deal with and give us the results of it with the microscope, and differentiate the varieties of pus. I believe the time has come for our dental colleges to create a chair and educate our young men in bacteriology, who shall familiarize themselves with the methods of pathological conditions which come before us.

I am somewhat surprised at the turn the discussion has taken. The members have been discussing the antiseptic properties of carbolic acid more than the subject of the paper.

Another point about the chloride of sodium does not seem to

be clearly understood here. Carbolic acid, as you have been told, does penetrate the dentine. It penetrates through the dentinal tubuli of the tooth. After the carbolic acid has been in a tooth for sixty or seventy hours and then removed and the sodium chloride put in, it is not considered a diffusible agent, but simply to demonstrate it does penetrate the tubuli of the tooth. Then we add nitrate of silver, 25 per cent solution, to the water where the tooth has been suspended and get insoluble chloride of silver, which is an absolute test that the chloride of sodium has penetrated the dentinal tubuli of the tooth.

Dr. W. A. Stevens, Chicago: I desire to say a few words in relation to creosote and carbolic acid. There is no difference in commercial carbolic acid and creosote, and I will defy any one who is blindfolded, who takes a bottle of carbolic acid and a bottle of creosote, to tell the difference. I understand that pure creosote is an extract of one of the wood tars and not of the coal tars. One is an escharotic, and the other is not.

Dr. J. G. Templeton: I have a word or two to say in reply to Dr. Stevens. He said there is no difference between commercial carbolic acid and commercial creosote. If I had some carbolic acid and some creosote here I would soon convince him that he is wrong by a simple test. If you take a drop of carbolic acid and one drop of collodion and mix the two together, you will have a beautiful looking jelly—a good thing for the toothache. Another test: Take one drop of pure beech wood creosote and one drop of collodion, and they will not form a gelatinous mass. Pure creosote and collodion will not form a jelly, while carbolic acid and collodion will.

Dr. Stevens: Extract of coal tar is not creosote in any respect.

Dr. A. H. Peck: I intended to say a word or two regarding the pathological phase of this question while on my feet before, but it escaped my mind. I will give the views of Dr. Black on this point. He does not attribute putrefaction of the pulp to chemical changes at all, but contends that in all cases the dead tissue within the pulp chamber or root canal must be infected with bacteria before putrefaction sets in, before gases and odors form, and before pus forms. There are different ways or mediums through which the bacteria gain access to the canals of the teeth. Very frequently from external openings, cavities, and so forth, pos-

sibly quite as frequently through the medium of the circulation of the blood. He contends and teaches that the pus microbes are present in the blood, not always, but to a very great extent; also that the bacteria of putrefaction are not present in the blood to such an extent as are a great many of the other varieties, but after the pulps die, speaking especially of teeth in whose root canals there are no external openings, before the gases and odors can form, the bacteria of putrefaction must be brought in contact with the dead tissue. The dead tissue lies there in a quiescent state until through some accident or otherwise the bacteria of putrefaction gain entrance to the blood, and are by it brought in contact with the dead tissue and the changes referred to take place.

Dr. Brophy has given us his experience regarding oil of cassia, and I must say that mine is precisely similar to his, and I go quite as far as he does when he made the statement that it should never be used in the treatment of pulpless teeth. There are other agents that will do the work quite as well which do not leave the bad results that oil of cassia does. The oil of cassia will not only produce tenderness and irritation in soft tissues, but if a small quantity is held in contact with soft tissue for any length of time it will produce a blister. This has been demonstrated more than once. There can be no doubt that in the vast majority of cases of pulpless teeth, that develop tenderness, whose soft parts about the roots become irritated—inflamed—in whose canals oil of cassia is being used, that said tenderness is directly due to the irritating effects of the oil. If some agent were used which is free from the irritating properties of cassia no trouble would result.

I have been requested to talk further on this subject, but I hesitate to do it, because I realize it is foreign to the matter under discussion.

Dr. Truman W. Brophy: I believe I made a statement about oil of cassia passing through the entire tooth structure. I should not have said that. I do not mean to convey the idea that it would go through the enamel, I meant the cementum and the dentine. While I am on my feet, I will say that my attention was first called to the marked brown discoloration of the teeth, which is due to the translucency of the enamel, caused by the oil of cassia, by Dr. A. H. Fuller, of St. Louis. He brought to my notice the fact that oil of cassia would produce brown discoloration of the tooth, and subsequent observations have convinced me

that this is correct, and I have abandoned its use in tooth canals.

Dr. J. E. Nyman: In the first place, I want to mention one of the first mistakes I made when I began to practice dentistry. I do not think it is the custom of many people to exploit their mistakes before a dental society, but I think sometimes we are all wiser for hearing them. I remember that one of the first cases I had after graduation was an upper first bicuspid, in the root canal of which was found a putrescent pulp. The tooth was still in a sore condition. I did not think it advisable to fill the root canal immediately. At first I used peroxide of hydrogen and then oil of cassia to dress it, and I believe I kept this up for eight or nine months, and really thought I was doing the best thing for the case. I thought there was a more or less putrefactive condition in that root canal which was causing the trouble. Finally the patient told me that she was discouraged, and thought she had better have the tooth out; and I had arrived at the same conclusion myself. I extracted the tooth for her, and found the pericementum very much inflamed. On holding it near the nose one could detect the oil of cassia very strongly. There was no sign of putrefaction or of suppuration about it anywhere, and I believe it was nothing but the irritant effect of the oil of cassia which resulted in that condition and necessitated the extraction of the tooth.

With reference to carbolic acid, a great many surgeons never use it at all. Another thing Dr. Reid spoke of was modern antiseptic surgery. Modern surgery is not antiseptic surgery at all, it is aseptic surgery. All the modern surgeon does is to boil his instruments and dry them with the evaporation of alcohol or chloroform. Dr. Graham and Dr. Senn have told me that before amputating a limb their instruments are carefully boiled and dried in the manner I have spoken of, and these gentlemen claim that the best thing one can do to bring about sloughing of a stump is to wash it with carbolic acid or other coagulant. Carbolic acid has as bad an effect on the leucocytes of the blood as it has on the bacteria and perhaps a worse one.

Dr. G. D. Sitherwood, Bloomington: I feel amply repaid for being present at this meeting to hear this paper, because it opens up a field of practical work to us. I have not made any such experiments along this line, and can only speak from clinical experience. I have frequently examined cases that had been treated

month after month with carbolic acid, by some other dentist, and yet the patient would state that the pulp chamber and root canals were not filled. I can understand from these experiments that carbolic acid will diffuse itself through the dentinal tubuli, but that does not prove it is the best antiseptic. I was also glad to hear Dr. Peck make his remarks. I wish he would read all the results as stated on that card, as it so nearly corresponds with my own clinical experience in daily practice. While it is true that carbolic acid is a good medicine to use, yet I take a little different view from Dr. Brophy regarding the essential oils. There are essential oils that are good. The question arises, can we use carbolic acid as such, and then follow it with the use of some essential oil? I have tried a good many, and I still come back to eucalyptol, not the essential oil of eucalyptol which is given to us by Merck, but the volatile extract of Sander & Sons. I find it much better in my clinical experience as it does not irritate the soft tissues, and as Dr. Wassall stated it does actually dissolve the septic matter from the dentinal tubuli, and a purified condition is brought about in that way.

I hope similar experiments will be repeated, and the work continued in order that we may arrive at the truth.

Dr. Garrett Newkirk: What I would have said has been partly covered by the remarks of Dr. Sitherwood. I was going to suggest that pending experiments we might get along a little while with the oil of cloves, eucalyptol, alcohol and chloroform, tincture of iodine, salt and water—something simple, that would be on the safe side. Let the experimentalists go ahead until they get this matter entirely settled.

Dr. York (closing the discussion): I have listened to the discussion with a great deal of interest, because I know a paper of this character could not be read without treading on some people's toes. There are some dentists who have used carbolic used for a great many years, but they have never known why they used it. There are those who have not used it because they have heard able men say that it was not a diffusible agent. They were both wrong. We should find out these things for ourselves.

I am glad of the opportunity of listening to some parts of the discussion, and with reference to some of the comments made by Dr. Harlan, I do not think for a moment he would imply that my tests were not made in good faith. But, at the same time, he

stated that the bromine water test was not a good one for the presence of carbolic acid in water. If I rightly remember, in a paper Dr. Harlan read some time ago, he made the remark that if a tooth which had carbolic acid sealed in it, was suspended in egg albumen, that after the carbolic acid had passed through it, and did not coagulate the egg, which we would hardly expect it to do, as carbolic acid in minute quantities is only a feeble coagulator of albumen. He suggested himself the advisability of testing this albumen with bromine water. Now, you cannot test egg albumen with bromine water because you would coagulate it if you did. When I use the same test in water instead of albumen, he shows a disposition to belittle the result of it. Here is the carbolized water in which I put the bromine water, and he says according to Bloxam that we have to have a yellow deposit, he means of course tribromphenol. You will notice it at the bottom of this tube. We have to have an excess of bromine water in order to produce this effect. I would like to make Dr. Harlan a present of this bottle and if he watches it carefully he will see the tribromphenol at the bottom, showing that the carbolic acid has passed through the tube. This is one of the best tests for diffusion of the agent which can be made referring to egg test. Dr. Harlan stated that the fact of the water becoming cloudy was not due to the presence of the carbolic acid, but to the presence of organic matter, that you can produce it in ordinary water. We will try it. (Here the experiment was made with hydrant water, results nil.) I think you would get tired waiting for tribomphenol to precipitate, you cannot get it unless carbolic acid is present in the water.

Some of the gentlemen, e. g. Dr. Harlan, have wandered a little from the text of my paper in talking about nitrate of silver. I have filled the root canal of a freshly extracted tooth with nitrate of silver 25 per cent and placed it in an incubator, keeping moist, leaving it there for ten days, and it never received light until I sawed it in half, and the discoloration was there before the light ever reached it. Therefore, if he has extracted teeth treated in the same manner and has not obtained similar results I would say he has not got the canal thoroughly saturated with the nitrate of silver, or he would have noticed discoloration of the tooth when extracted.

I understand Dr. Harlan to have stated that carbolic acid is a barrier to its own diffusion; that after it has coagulated the orificial

ends of a tube it will not proceed any farther; that it will not coagulate all the way. Am I right?

Dr. HARLAN: I do not believe it will.

Dr. YORK: I have here some capillary tubes that I have filled with egg albumen. These are as fine as I could draw them out. Of course, I could make them finer. I have here, you will notice, a capillary tube, which is hollow; egg albumen is drawn up into it by suction, the end put into a flame and sealed. We have a tube containing egg albumen, we put it into the dish with carbolic acid, the latter comes in contact with this end; if it was a barrier to its own diffusion it would coagulate there and penetrate no farther.

With regard to the experiments made by Dr. Harlan with teeth in this plaster, I hardly think to take a tooth and build up plaster around it, which gets dry and cold, is a fair test. It is not nearly the same condition that we have in the mouth. Try and keep it as nearly in the same condition as we have it in the mouth if you wish to get the same results that we do in the mouth.

With the iodine test, he says that I have not demonstrated anything. I would like him to state why we do not get a reaction of the blue iodide of starch in the presence of the salts of calcium of a tooth. Why don't we? We get it in the water and starch. Why don't we get it when we have pulverized tooth in the water? Because we cannot get the reaction of the blue iodide of starch unless we have free iodine. As soon as it comes in contact with the salts of calcium it becomes an iodide with one of the bases with which it unites, consequently there is no free iodine. You cannot get it. I would like Dr. Harlan to tell me wherein I have failed to demonstrate that point.

With regard to the remarks of Dr. Reid, they are all right. He is a good fellow. I do not care very much about what has been said concerning Sir Joseph Lister and others who use carbolic acid in their operations. I am not here as the champion of carbolic acid either as a disinfectant or antiseptic.

As regards the remarks made by Dr. Peck, he has wandered away a little from the subject under discussion, but I was very much instructed by what he said because he is always interesting. I think he has answered some of the questions I put to him some time ago not exactly bearing on my paper with regard to the pulp in a tooth that had died owing to a blow, for instance, and in that case we have a hæmorrhagic infection of the tooth, congestion

and stasis with consequent death and a necrotic condition of the pulp. I asked him why we got pus in all these cases, and he said it was owing to the presence of pyogenic bacteria in the blood. But I fail to find that the best writers tell us there are any bacteria in normal blood. Normal blood is sterile. It is strange that all of our patients who have this trouble must have bacteria in their blood. Take ten men, let them bruise their hands, and according to this theory they should all have abscesses; they should all have bacteria in the blood, but they do not. I looked up the contributions of Welch in the *American Journal of the Medical Sciences*, and he is as good an authority as we have. He says that bacteria are not present in normal blood or in the organs; that they are taken in by the mouth and lungs, but are not ordinarily there.

With reference to the remarks made by Dr. Wassall, I think they were a little irrelevant to the paper. As I have previously remarked, I am not here as a champion of carbolic acid as an antiseptic or disinfectant. My object is to show you that it will diffuse through dentine. He states that when you coagulate the contents of the dentinal tubuli, or when you do not, I think he said—when you seal it all up in there, it is innocuous. It is, as I said before, changed in its character; you make a different chemical compound; you cannot coagulate albumen and still have albumen pure and simple. You have a stable chemical compound, an insoluble one. If you put in an essential oil, you do not alter the character of the contents of the tubuli. It will pass away in time. If you put in carbolic acid and change the character of the tooth or the contents of the tubuli, you have left there an insoluble compound. It will last till the end of time, or as long as the tooth does.

With regard to sore teeth, he does not believe what I have said. He says he has cases of sore teeth. While that may be, he will find, if he could look at those teeth that the soreness had proceeded from the apex every time. You cannot differentiate as to whether it goes through the tooth or not. You must have something a little more definite than to say you have lame teeth. You must say how you have them. A lame tooth is not produced by septic matter passing through dentine and directly through the cementum and irritating the peridental membrane. It is altogether from the apex, every time.

With regard to the oil removing the characteristic color, carbolic acid does not need to do this; it has changed the character of the contents of the tubuli. Dr. Heitzman states that if we

look at the contents of the tubuli with a microscope after they have been coagulated, the living tissue will be found to be dried up and shrunken. In this event, this is no fit pabulum for the development of microörganisms. The microörganisms must have moisture, something that they can live upon; they cannot live upon albumen which is coagulated by carbolic acid.

I believe Dr. Lowry said something about its preventing penetration. Dr. Lowry did not see the tubes I have passed around, but I think now he will alter his opinion, or should, because the tubes demonstrate very clearly that carbolic acid will coagulate albumen the whole length of the tube.

With reference to the experiments made with extracted teeth, we have to use them as they are the nearest approach to anything we can get to teeth in the mouth. I would like to experiment on some teeth in the mouth and pull them out afterward, but patients might object. We have to make many of our experiments on the lower animals, as dogs, cats, guinea pigs, rabbits and mice. We do it because they are the nearest approach to human beings. I think the conditions under which I have made my experiments were as near the same as those we find in the mouth as possible. The teeth had been extracted, and within an hour I had carbolic acid sealed in the canal and the tooth in an incubator. There is no decomposition to take place in twenty-four hours at the outside of the tooth or anywhere.

With regard to the remarks made by Dr. Brophy, inasmuch as he did not touch upon anything more than the essential oils, there is very little or nothing to reply to.

Dr. Johnson's remarks were very nice and encouraging. He is always a friend to young men who try to push themselves forward, and I feel that if we had a few more gentlemen like him in the profession the younger members would not be so backward in attempting to stimulate the profession by preparing and reading such papers as I have presented to you. A short time ago I read an article in the *Dominion Dental Journal*, in which he said he always felt sorry for the young man when he first got up and read a paper before a dental society; and I thank him for his sympathy and kind words expressed toward me.

The clinical experience of Dr. Nyman is interesting as to the use of oil of cassia.

I believe I have covered all of the points that were brought out in the discussion, and I thank you for your attention.

HOW SHALL WE BEST INSERT A GOLD FILLING.

By Arthur Galusha Smith, D. M. D., Peoria, Ill.

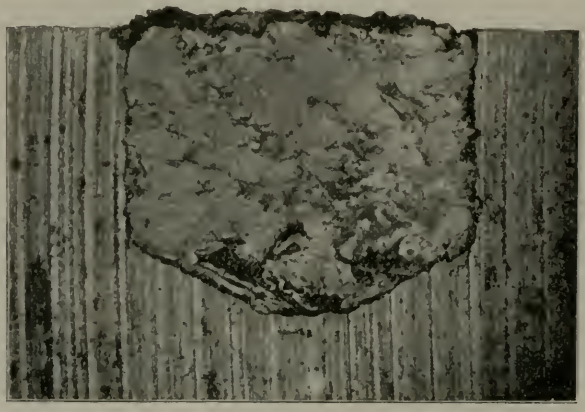
The unusual is always interesting and occasionally beneficial and instructive, but I venture to say that not 5 per cent of our members give a majority of their time to those operations which may be fairly counted as rare, while we go on day after day seeing and treating practically nothing that is out of the ordinary. Therefore it is to the everyday affairs of our profession that we must devote the greater part of our care, study and attention if we would give to our patients the greatest possible amount of comfort and satisfaction, achieve success for ourselves and bring credit upon our calling.

The subjects of replantation, implantation, devitalization, local anæsthesia, successes and failures of crowns of various kinds, porcelain inlays, gold inlays, the latest and most fashionable cure for pyorrhœa, the all-absorbing topic of cataphoresis, these in turn have each arisen, and like comets of greater or less magnitude have spread themselves over the sky of dental thought and investigation and for the time being, obscured many of the trustworthy guiding stars that have burned steadily since the dawn of our career as a separate and distinct profession.

Of the many operations that have served to bring us onward and upward in years past, that faithfully maintain us where we now stand, and that continue to lure us forward with promises of richer reward and higher achievements in the future, none has been more constantly and uniformly prominent than that of restoring with gold portions of the teeth that have been destroyed through caries, wear, or accident. It has required years to bring the gold filling to its present degree of usefulness and perfection, but its history, though interesting, does not at present concern us. What *we* should strive to find out and thoroughly understand is, what constitutes, to-day, the best gold filling, and what is, all things considered, the best means of producing it.

I need only allude to the two distinct kinds of gold used in

fillings, namely, "soft" and "cohesive." A "soft" foil, strictly speaking, cannot be rendered in any degree cohesive by annealing. However, many of the so-called soft foils now on the market will



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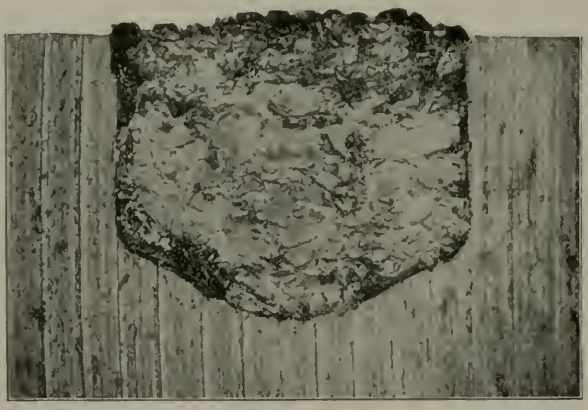
develop a certain amount of cohesion when annealed. A "cohesive" foil on the contrary is rendered so sticky by annealing that a mere touch will unite two pieces, while a blow or heavy pressure



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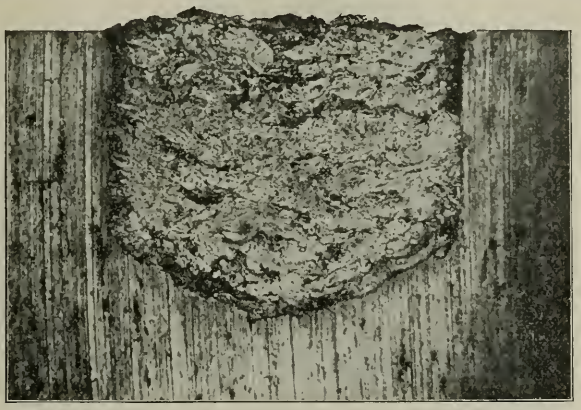
will make them become as if of one piece. These differing properties of the gold as it comes to our hands from the dealers, are fixed and unchanging and must be carefully borne in mind as

they make the two kinds of gold almost exact opposites in working properties.

I believe that cohesive gold is now in far more general use



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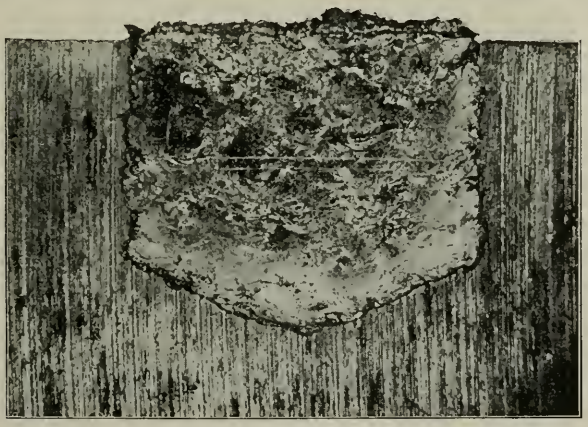
than the older soft variety and it is chiefly with the subject of cohesive gold that it is the purpose of this paper to deal, for I have yet to see the cavity that it was possible or desirable to fill with



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gold at all, that, to my mind, could not be better filled with cohesive gold than with soft gold either alone or in combination with cohesive. I am well aware that this is a broad statement and one

that is not generally accepted; for, while there are comparatively few fillings now made entirely of soft gold, nevertheless many operators still cling to it as of peculiar and almost supernatural effi-

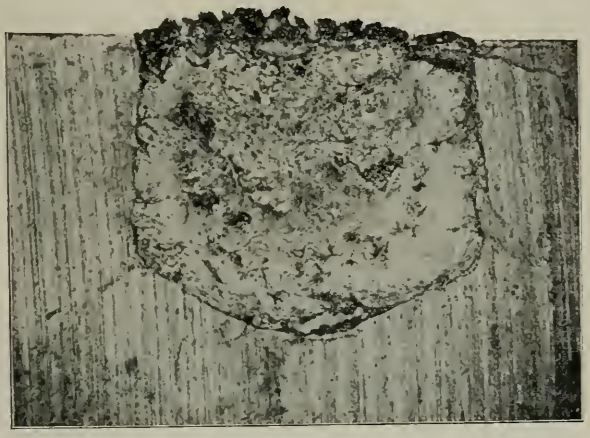
No. 5.

cacy in starting fillings and in "protecting" the cervical margin. (I might remark right here that the term "protecting the cervical margin," which is in such universal use, is a very happy one, as

No.6.

most of the cervical margins we see are in dire need of "protection" of some sort.) There are reasons for the preference shown soft foil in the two places mentioned, namely, its easy working

properties, the rapidity with which the starting of the filling can be accomplished, and the general wholesale manner in which the cervical margin can be "protected" and the deepest and most in-



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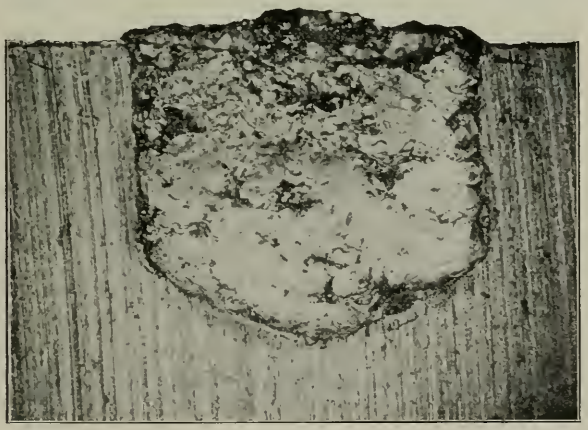
accessible portion of the cavity filled, placed out of sight, and disposed of.

Of course there are cavities which have no cervical margins



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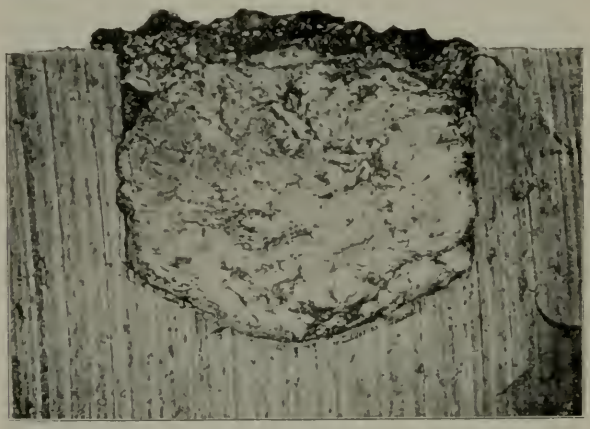
and practically no inaccessible portions. I refer to the box-like cavities having four walls, and these are the only cavities where fillings made entirely of soft foil, are now, I believe, ever advised;

but even in these simplest of all cavities I still think that cohesive gold is far the better material to use and for reasons that I shall strive to make clear before I finish.

We are all familiar with the soft gold fillings in crowns and buccal surfaces of short yellow molars, that have been in, so our patients tell us (and I have not the slightest doubt that they speak truly), "ever since s'teen years before old Dr. So and so died, who was a fine dentist but awfully rough." These fillings have done great service and all honor to the men who put them in, but how about it when we come to proximal cavities in the bicuspids?

I doubt if there is a practicing dentist in this room who has not had to remove gold fillings from these cavities and in so doing



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how often do we take out of the grinding surface a hard nugget of cohesive gold and then from the cervical third of the cavity dig out a mass of soft gold that seems to be somehow disintegrated and like so much yellow sausage. Again, how often have we seen soft gold fillings that are battered out of shape, rough, uneven, pitted, discolored, and a disfigurement to the tooth. The cohesive filling is more dense, is harder and wears longer, is susceptible of and will retain a higher finish than soft gold ever can.

The objections to the use of cohesive gold are chiefly its difficulty of manipulation, length of time required for its insertion, necessity of keeping the tooth perfectly dry during the entire operation, the alleged difficulty of making a good adaptation to the cavity

walls, expense and discomfort to the patient. Were it not for these few objections cohesive gold would be almost the only material used for filling teeth to-day.

Unquestionably it often is a difficult matter to start a filling with cohesive gold, that is to get the first few pieces firmly anchored in place. Especially is this true if we try to make the start with foil and the cavity happens to be one where we can see nothing except in the mirror. Happily we have cylinders, mat and sponge gold to help us out of this difficulty. These are all true forms of cohesive gold but owing to the peculiar properties imparted by the processes of their manufacture can be gently thrust into the cavity where we can coax them into undercuts and retaining grooves and condense them at our leisure. I use very little mat gold and never depend on it for any anchorage strength, simply a very tiny piece at the start for the purpose of saving time. Any filling may be started with cohesive foil, if our skill and patience are adequate.

Now we come to what in itself constitutes the major portion of the operation, namely, the condensation. For this purpose we have live blow and dead blow hand mallets, automatic mallets, pneumatic mallets, mechanical mallets, electrical mallets, in short, nearly every kind of mechanism that can be devised to deliver a blow at all, and last but by no means least, we have hand pressure, and it is to hand pressure condensation that we must look for deliverance from many of the evils already mentioned as being connected with cohesive gold.

In order to show the results of hand pressure and the mallet condensation more distinctly I have made a series of fillings which I shall presently show you with a view of testing the mallet and hand pressure side by side.

You can readily see that with as many kinds of foil, mallets, pluggers, etc., as there are now on the market there is no end to the combination of instruments and material that it is possible to make and it would obviously be impossible for me to exhaust such combinations in practical experiment. What I have striven to do is to make fillings which should be representative of their class and to make them by methods with which I felt myself to be reasonably familiar and well skilled.

To make these cavities I had holes drilled in the most accurate manner possible in untempered tool steel. The holes being of

absolutely uniform size and depth. I then had these steel ingots containing these holes planed on one side until one-half the diameter of the holes had been planed away, thus leaving cavities in the steel that were as nearly as possible the size and shape of a moderate sized proximal cavity in a bicuspid.

The margins of the cavities were in all cases prepared with a hand chisel, the same as if the work were being done in the mouth. I next took a piece of true edged plate glass and placed it on what would correspond to the proximal surface, as if it had been a matrix. The steel ingot containing this cavity with this glass matrix in position was then imbedded in plaster. After the plaster had become thoroughly dried, slight undercuts were made with the engine and the cavities were filled each by a different method which I will describe as I show the results.

In making these fillings my assistant placed the gold and kept count of the number of pieces used while I myself kept count of the number of blows or thrusts and of the time consumed in the operation. So far as I am able to judge I showed absolutely no discrimination in my work, merely trying to produce a filling which should be good of its kind. I put forth no special effort at any time to produce an operation that should "show up well" or prove any of my pet theories nor did I at any time use a force, either of mallet or hand pressure that could not be easily borne by even a frail tooth.

EXHIBIT OF SLIDES.

No. 1. Filled with cohesive foil, using finely serrated flat-pointed pluggers, 49 pieces, 750 thrusts of plugger, time 18 minutes.

No. 2. Filled with cohesive foil, using a slightly coarser serration, same size point, 56 pieces, 650 thrusts of plugger, time 15 minutes.

No. 3. Filled with one-half cohesive cylinders, using smallest Royce point made, 35 pieces, 620 thrusts of plugger, time 13 minutes.

No. 4. Filled with one-half cohesive cylinders, using finely serrated square pointed pluggers, same as on No. 1. 38 pieces, 618 thrusts of plugger, time 15 minutes.

No. 5. Filled with one-half cohesive cylinders, using coarser serration, same as No. 2. 39 pieces, 540 thrusts of plugger, time 13 minutes.

No. 6. Soft foil rolled in cylinders, time of inserting 6 minutes.

AUTOMATIC PLUGGER CONDENSATION.

No. 7. Filled with cohesive foil, cut in small pieces, using medium serrated plugger, time 22 minutes, 910 blows. (This ought to be the best of the lot.)

No. 8. Filled with one-half cohesive cylinders, using automatic plugger of medium serration, 36 pieces, 750 blows, time 18 minutes.

No. 9. Filled with one-half cohesive cylinders, using smallest size Royce point, same as No. 3. 44 pieces, 762 blows, time 17 minutes.

Several things appear in these results which are a decided surprise to me. For instance, I had always supposed that a blow from the mallet would accomplish more in the way of condensation than a thrust of a hand instrument, though I was thoroughly sure that it was not as good for the tooth. These tests, however, show conclusively that working on the same material it requires more blows than thrusts to pack a given number of pieces in a cavity of a definite size. Thus in No. 4 38 pieces were packed in the cavity with 618 thrusts in 15 minutes, while in No. 8, using the mallet, 750 blows were delivered in 18 minutes, and only 36 pieces of gold were gotten into the cavity at all.

In other words a slightly greater degree of condensation was reached by using an average of 16⅓ thrusts to the piece than when using 21 blows to each piece of the same size. Also I was surprised to find that hand pressure consumed less time than the automatic.

So much for the tests outside of the mouth, but it is in practical work at the chair that all operations must be finally tested, and in this connection there are many things to be said in favor of hand pressure. To begin with, by this means force can be applied in any direction with almost equal facility, and this fact alone makes the number of "inaccessible" cavities very small indeed. When one becomes accustomed to hand pressure, there are absolutely no cavities in the mouth easier to fill than those in the distal surfaces of the superior cuspids, bicuspids, and first molars. Work on the incisor can be done from the inner or palatal side with the greatest ease both to patient and operator, as the chin

does not interfere with the plugger handle, even when the mouth is partially closed.

Large buccal cavities on the molars (especially those on the third) are almost impossible to reach and fill with any instrument which depends on a blow for its efficiency, for no matter what the shape of the plugger point may be, the force of a blow at the end of the instrument must always travel exactly parallel to the long axis of the handle or shaft; it is thus utterly impossible, in many instances, to properly pack against a buccal or an anterior wall, when the cavity is situated far back in the mouth, with any mallet with which I am acquainted. Again in hand pressure the sense of touch is not benumbed and partially paralyzed by a heavy and cumbersome instrument as is the case with the automatic, or by any rattling or clattering vibration as with many of the other forms. An important point in all gold fillings is to get them condensed evenly, and there is no way of getting information with regard to how far we have carried our condensation except through the sense of touch. We condense a filling, do we not, until it *feels* hard enough, and we *feel* that it is time to add the next piece.

The lighter and more rigid the instrument with which we feel, the more accurate is our information sure to be. Who would tolerate a handle of the size, weight and looseness of an automatic plugger on an excavator or chisel. Such an instrument would be the laughing stock of the profession should any one try to put it on the market. Who would try to prepare a cavity margin with an instrument vibrating and chattering about as do the electrical, pneumatic and mechanical mallets? Surely no one. Would we not say that such instruments as these were far too clumsy for such accurate and delicate work? Yet if there is one thing that we need to do more accurately than another it is to perfectly adapt our gold to the margins and walls of the cavity we have made.

No matter how perfect our preparation, no matter how neat and beautiful the finish of the filling, if at any point we fail materially in our adaptation the great majority of our work is sure to fail, and when we see it as the years go by, we ourselves deep down in our own hearts will know that we have failed and fallen short of what we should have accomplished, even though our patients are satisfied that it was "all their fault," and cheerfully have the work replaced with faith in us unshaken and unwavering.

The teeth are by nature designed to withstand pressure, but not blows.

Dr. Black, in his experiments with the gnathodynamometer, some two or three years ago, showed us conclusively that it was almost impossible for a person to injure the teeth by exerting the extreme force of the muscles of mastication, provided that force be exerted gradually, but how different is the result of the same muscular action when we bite suddenly on some hard substance and thus give a blow to the teeth.

In other words, we recognize the necessity for avoiding blows upon the teeth and instruct our patients to avoid them as far as possible, and yet we ourselves make such large use of them in condensing gold. Is not this an illogical position on the very face of it?

I have seen many large and beautiful fillings that were made with the mallet, but in very many of them there have developed large pits or soft places, showing that the condensation was not even. Again, many of the teeth containing large malleted fillings are so badly checked as to be beyond repair as soon as the first chip falls out of the cavity margin.

Loosening and soreness of the teeth is always the immediate result of any considerable amount of malleting, and this sometimes never entirely subsides.

With the use of hand pressure all these disagreeable sequelæ are much lessened or entirely done away with. How many times after the insertion of a large gold filling have my patients remarked in surprise "Why doctor, that tooth wasn't even sore the next day."

Finally we have to consider the operation from the patient's standpoint and here I can speak with feeling and appreciation and utterly free from bias, for I think that I have had gold fillings put in by almost every known process except that of the Herbst burnishers and from the patient's standpoint I must say that no method of condensing gold with which I am acquainted is so free from discomfort and objectionable features. There is no noise or jar of any kind connected with the operation and this fact makes the nervous strain on the patient much less and this attitude of ease and rest in the person on whom we are working, adds much to the rapidity and freedom from tension with which we do our work.

My patients are warm in their praises of hand pressure and it was largely this fact that induced me to persist in using it and finally rely on it altogether. When they have a filling done in my office for the first time they almost invariably express the greatest relief and astonishment at the absence of what they usually term the "pounding" or "that little thumping machine." At this time when we are ostensibly striving so earnestly to take away those things which are sources of discomfort to our patients, can we afford to overlook anything which is so simple, so effective, and so free from discomfort?

No one mallets a filling from the very start. More or less hand pressure is necessary in order to carry the first few pieces of gold to place no matter what method we use in starting our fillings

If this is more effective in carrying gold to place against the walls of the cavity at the start, can there be any valid reason why it will not secure a better adaptation throughout the entire operation?

I fully realize that no two men work exactly alike and that a method which is a success in the hands of one operator will be much less satisfactory in the hands of another, but I do believe that this matter of hand pressure condensation is worthy of an earnest trial on the part of every one of us.

I formerly used the mallet as exclusively as any man possibly could and considered everything else too utterly out of the question, to be even seriously considered, but I came in close personal contact with a most expert operator who was an enthusiastic advocate of hand pressure. The beautiful results which he achieved and the ease with which he worked in cavities which were difficult of access to me and my mallet set me to thinking and finally to experimenting with that which I had formerly been content with ridiculing. It required considerable time for me to get the muscles of my fingers trained so that they could stand the long continued exertion, and I had better pause here before I finish and say that it has not been a question of the easiest way to do a gold filling that I have been considering, but this was the only difficulty encountered and it has long since disappeared.

Some day when you have a cavity that is difficult to reach in a satisfactory manner with your mallet—and you won't have to wait long for this opportunity—and rather small, just try hand pressure

for awhile. If you get tired, take up your mallet and finish out with that, but *keep on trying* until your muscles become thoroughly accustomed to the work, and it will not be until then that you can pass a fair judgment on the work, and I am sure that you will do with your mallets just what I did with mine—let them lie in the drawer unused for a couple of years, and finally discard them altogether.

ANCHORING LARGE CONTOUR FILLINGS IN INCISORS.

By L. W. Skidmore, D. D. S., Moline, Ill.

From my observation of contour fillings I am led to the conclusion that we have in the anchoring of large contour fillings in incisors, where there is little penetration of decay toward the pulp, a class of fillings that seems to tax the ability of the average operator to perform.

I believe many of the failures in these fillings which we credit to soft teeth could be traced to improper anchorage.

While I have nothing new or original to offer, I think a mild thrashing of the old straw again at this time may not be in vain, so I feel no further apology is necessary for presenting this subject for your discussion.

The anchorage of all fillings which will be subjected to severe strain should be such as to protect them from any force that would tend to dislodge them from the cavity. The anchorage should be made as strong as possible without weakening the tooth.

There should be a strong square base at the cervical portion of the tooth for the filling to rest upon.

The plea that tooth structure should not be sacrificed is wrong and should not be considered. When a tooth is presented for our treatment the question to consider is, how can this tooth be put into the best condition to have it strong and lasting.

The question of saving this or that portion of a tooth we should not allow to prevent us from putting the tooth in the best possible condition for endurance.

The usual method of preparation is after giving the usual conformation to the cervical portion of the cavity, the anchorage at the occlusal part of the tooth is obtained by drilling obliquely between the two plates of enamel toward the cutting edge of the tooth. See Fig. 1. This is the method of anchorage which I find so often develops a weakness, resulting in a leaky filling and the formation of a crevice at the line of juncture with the enamel.

Other unsatisfactory results will often confront the operator who depends entirely upon this method.

It is against persistent use of such anchorage I wish to protest, as I believe a better method can and should be employed, one that will save us many failures, and relieve us of the burden of telling our patients their teeth are too soft to hold the filling.

It is seldom sufficient in any class of cavities to risk the anchoring of the filling to what can be obtained by shaping the cavity as formed by the decay, but in order to anchor a filling so it will stand the force of mastication, it is usually necessary to extend the border of the cavity beyond the line of carious destruction and in these fillings I consider it very important. Having determined to involve the corner of a tooth in our filling, enough tooth substance must be sacrificed to allow sufficient gold to be packed into the incisal portion of the filling to resist the strain of mastication.

The cavity must have enough retaining shape to resist the strain.

Some writers recommend the cutting of an auxiliary dovetail upon the lingual surface, as in Fig. 2.

This is doubtless an improvement on the first method described, and may be sufficient in some cases.

In dealing with these cavities involving the restoration of the corners careful attention should be given to the formation of the cavity border, which should be free from angles. It should be a continuous curve, not a succession of curves, as irregular borders will produce weakness along the points of contact between the filling and the tooth and chipping of the margins will often occur while packing the gold, or if not then, you will frequently find it so in a short time afterward.

Such a filling we have represented in Fig. 3, and is a method of shaping the cavity border too often employed. We have the cavity border curved, but it is a succession of curves and they make a weak border for any filling.

The sharp point at *a* should have been cut away, for even if the filling should be inserted without causing a fracture at this point, the force of mastication is to soon break it away.

The deep cut B is also wrong, as the gingival border to be strong should be formed flat against which the gold can be packed without fear of fracture.

In Fig. 4 we have represented the proper curve which should

be given to the cavity border in these cases and while it is stronger it is also certainly more pleasing to look upon.

It also represents the gingival border properly formed. To more fully explain the method of anchorage, I wish to recommend, as it has given me the greatest satisfaction, take an upper central incisor, the whole mesial surface being decayed, with little penetration toward the pulp, and I would prepare it as I have shown in the cuts Nos. 5 and 6. The cervical half of the cavity is shaped in the usual way, but instead of following the usual method of obtaining anchorage for the occlusal half of the filling by drilling obliquely into the cavity between the plates of enamel which gives us but a frail anchorage at best, one which is liable to fracture, resulting in dislodgment of the filling. I cut a groove leading from the cavity distally to near the center of the tooth, and in some cases I cut the groove entirely across the tooth.

Fig. 1 Fig. 1 Fig. 2 Fig. 3 Fig. 4 Fig. 5 Fig. 6

This groove must be made deep enough and wide enough to hold a sufficient amount of gold to give the necessary strength to stand all the force which may be brought to bear upon it in the act of mastication, and it should be made slightly deeper at the point furthest from the cavity which will greatly assist in binding the filling in and more fully prevent its dislodgment.

Some may object to the labial plate of enamel not being protected more than represented, but by carefully beveling the cavity margin and building gold over, it will be fully protected.

In cases where the pulp has been freshly devitalized and the tooth healthy, the root canal offering such a place for good anchorage, would cause me to save as much of the crown as possible.

In cases where the pulp has been dead for some time and the tooth in a dry and brittle condition we will often do the patient better service by replacing the old tooth structure by an artificial crown.

DISCUSSION ON PAPERS OF DRS. SMITH AND SKIDMORE.

Dr. C. N. JOHNSON, Chicago: *Mr. President:* I think I shall have to take off my hat again to the young men. I am much gratified with this paper, because it is the beginning of an investigation along lines that I believe will lead to more definite results in regard to our manipulation of gold. It is an investigation of the same subject, along a slightly different line, that Dr. Black studied in the physical properties of gold.

I want to say a word or two in regard to the nomenclature of this subject. If we are going to accomplish the best results in dental literature we must have more uniform and definite terms to use to convey our meaning. The essayist has used the terms employed by nearly every essayist, and by dental manufacturers, in designating different kinds of gold—"soft and cohesive." I believe one of those terms should be left out of our literature, and that the terms should be definitely "cohesive and noncohesive." I am sorry that this term "soft gold" sticks to the literature of the profession. It is not a definite term; it does not convey what the essayist wishes to convey. The dental manufacturers have almost forced us to continue these terms by placing them on their product. We may have a gold which is to all practical purposes soft and still it may be cohesive. As a matter of fact, cohesive gold is softer than noncohesive. You take a piece of plate gold and anneal it to make it soft; the same with a piece of foil gold, you anneal it, and that foil is softer than it was before. The reason that the terms soft and cohesive were used is because a pellet of annealed gold is more "sticky" under the plugger and the mass is not so easily manipulated by pressure as the noncohesive. But the term soft is a wrong one, and I am in hopes the profession will discard it in the new nomenclature. We have been indefinite in our phraseology and have not conveyed the meaning we wish to convey on account of this indefiniteness.

As to the use of noncohesive gold along the cervical margin, as advocated by many members of the profession, it is used in such a place, not so much because we cannot get adaptation with cohesive gold, but because in placing a layer of noncohesive gold and condensing the cohesive gold upon it, we have a cushion for the cohesive gold to be condensed on and can mallet over that part of the filling with less danger of injuring the enamel margin than we could if we started with cohesive gold and began our condensation

in the early part of the operation. That small piece of noncohesive gold serves as a cushion to protect the margin from injury from the malleting force. I agree with the sentiment of the essayist, that we do not want to use much noncohesive gold in building up proximal fillings in molars and bicuspids. The only noncohesive gold I would use would be the first layer. From that point up I would use cohesive gold on account of its greater density. But I do not want at this time to enter into a discussion of the relative merits of noncohesive and cohesive gold.

As to the methods employed for testing the relative merits of mallet force and hand pressure, I am glad the essayist has started this line of investigation. I would suggest to him, however, in pursuing this work further, which I hope he will do, to aim at greater definiteness and more accuracy as to his manner of doing these things and making a record of them. The small things in the manipulation of this material seem unimportant to the man who is doing them, but every little movement made is of importance in the final result. I would suggest to the essayist, in following out this line of investigation, that he measure the amount of force which he uses in his hand pressure—follow that out definitely, as well as measure also the degree of the blow that is used, and then by counting the blows and thrusts as they are delivered, he will be able to tell by which method the greatest amount of force is necessary for a given condensation of the filling.

As to the relative merits of hand pressure and the mallet force. This paper is very encouraging to us for this reason, namely, that by virtue of necessity we have been obliged to put in gold fillings by hand pressure. There are cavities so remotely situated that we must rely on hand pressure for the insertion of the gold, and, as I said before, it is encouraging to note from these investigations the efficacy of the condensation of gold by hand pressure. In my practice I have had a diametrically opposite experience to the essayist. In my first manipulation of gold I inserted it by hand pressure, and did this for a year or two during my early practice. The conviction began to come to me that I was using more force on my fillings for a certain degree of density with hand pressure, than would be required by the mallet blow. These experiments may disprove my impressions, that with an equal force by the mallet and hand pressure we get a better condensation with the mallet than we do by hand pressure. To my mind it may be

illustrated in this way: If we are going to drive a nail into a board, suppose we put a hammer on the nail and press upon it slowly, it would require enormous pressure to force that nail into the board; but if we strike the nail with a blow, in it goes. I think this is a good way to illustrate the relation between these two processes. In any event, I believe we can get a greater degree of density to a filling, with less aggregate amount of force with the mallet than we can with hand pressure. Of course, this impression may be erroneous, and it remains for future investigation to measure the result of the force of hand pressure which is used in the insertion of a given filling, and the degree of force that is used with the mallet. There is one point in this connection which I think is worthy of consideration, and that is the kind of mallet the doctor has used in his experiments. I have not used the automatic mallet in recent years at all, and so far as delicacy of manipulation is concerned, we get greater delicacy with the hand mallet than with the automatic mallet. The objection he has made to the automatic mallet is a good one. It is a clumsy instrument for any kind of work where precision is required, as well as nicety of adaptation or application. I would like this series of experiments regarding the use of the hand and automatic mallets, and all of these various appliances carried out and the results given.

In regard to the soreness and loosening of teeth from malleting, of course we must consider the comfort of our patients in every way possible, but ordinarily, if we hold a tooth steady while malleting the filling, we can do so without any perceptible degree of soreness. If we leave a tooth unsupported, when we strike a blow it is driven into the socket, the membrane rebels, forces it slightly out, and then we drive it in again with the next blow, until we get the membrane sore and inflamed. We can avoid that by holding the tooth perfectly firm, so that there is no driving in and out of the socket of the tooth in malleting.

One thing strikes me in these slides as I examine them. The failure of good margins might have been due in this instance to either one of two things, the form of the plugger, or the fact that the glass was fastened tight to the margin. When a matrix is placed on a tooth it should be so adjusted that we may force the matrix away from the margin and carry the gold between the margin and the matrix, so that from these slides we must not judge the doctor's ability as a manipulator of gold, nor his ability to

cover margins perfectly in the mouth, because he was operating at a serious disadvantage from that one fact.

Another point is with reference to the form of instruments, and I wish he would tell us more definitely what instrument he uses in different cases. I understood him to say that he used a round pointed plugger, which is not the proper form of instrument to insure good adaptation along the angles of cavities. We need a plugger that will follow the outlines of the cavity margins. A round plugger with a flat end is not effective either in experimental work or in the mouth. These instruments are well enough for building up the filling, but not to protect margins.

Another point which impressed me in connection with this investigation was, that there are several things to be considered in the proper insertion of a gold filling. We want density of the filling in order that it may sustain the force of mastication; but above and beyond that, we want adaptation to the margins to prevent leakage. The densest filling conceivable is almost useless if it leaks.

I do not want to consume the further time of the society. I simply wish to say in closing that I have been encouraged by the line of investigation the doctor has started on. I hope he will study the points that have been brought out more closely and precisely, so that we may get from him on a subsequent occasion a definite statement of every detail of the operation. Of course, he understands and is familiar with every detail, but judging from the questions that have been asked regarding these slides, several of the members seem to have been confused from a lack of minute description of the operation. Possibly the essayist neglected to give a minute description for fear of tiring the members. But the fact of these questions being asked, proves to us that we must go definitely into every detail. I hope the paper will bring out a full discussion.

Dr. R. M. Pearce, Rock Island: I think the method referred to by the essayist in Fig. No. 1, is the one which is pretty generally advocated. In No. 2, I think if he would cut or make a step of the cavity and do away with the point it would be far preferable. The method he suggests in Nos. 5 and 6 is more nearly my idea, although in Fig. 6 I think we ought to cut deeper on the lingual wall making it thicker and consequently stronger, so that when filled it would better stand the force of mastication than it would in a more narrowed condition.

Dr. J. E. Nyman, Chicago: I believe the essayist made the statement that noncohesive gold could not be made cohesive, and vice versa. In this he is mistaken, any of the noncohesive foils, with one exception, which is not a pure gold foil, can be made cohesive by annealing, and all of the cohesive foils without exception, can be made noncohesive by exposing them to the fumes of ammonia.

Another thing he said, that cavities in which the gold filling was condensed by hand pressure took a larger amount of gold to fill them than the cavities in which the gold filling was condensed by the mallet. My criticism of this point is that he does not know whether he got more gold in such cavities or not, simply for the reason that pellets of gold are not of the same size, and he has based his estimates on the number of pellets put in. If he wants to know about that, the gold should be carefully weighed before it is put in as a filling material, and the weighing apparatus should be of the most delicate kind. This is the only way one can tell whether he has more gold in one cavity than another. Gold pellets vary in size and weight, even if taken out of the same bottle.

With reference to hand pressure, I used to be something of an oarsman. I have a strong forearm and wrist and hand. I have used hand pressure in my dental work, and I wish to say that hand pressure unnerves, to say nothing of tiring one, and I have had the disagreeable feature of cramps in my fingers and hand when I have used it for any length of time. Another point. There is danger constantly, where we use a plugger with a curve near the end, of that plugger slipping and twisting and sliding out of the cavity through the rubber dam and lacerating the tissues. When you use hand pressure your patient is in constant fear that your hand is going to slip. I have had patients tell me that they were almost afraid to draw their breath for fear I would go through their cheek with the plugger. When one has used hand pressure for a considerable time he loses the delicate sense of touch, so that he does not know exactly what pressure he is using.

Hand pressure, the hand mallet, the automatic mallet and engine mallet can be used to advantage in various parts of the cavity. I use the automatic mallet very little, yet some patients prefer it to anything else, because they know I am going to use the same blow each time. With it one can deliver a very delicate blow.

Another point. I suppose you are all familiar with the Bos-

worth right angle mallet, which is one of the nicest instruments I have got in the office. You can deal a fixed blow with it every time, and there is no danger of slipping. It can be used to advantage in the deeper parts of proximal cavites in bicuspids and molars. You can deliver a direct blow with this instrument that you cannot with any other mallet. The same holds true in a buccal cavity. You should strive for as thorough condensation as you can get by mechanical means, with the blow as uniform as possible.

Dr. S. F. Duncan, Joliet: In regard to the use of the automatic mallet, I have used it a good deal in my work, and I have also used the hand mallet. I find as I look at my fillings that were put in a little while ago with the automatic mallet, that they do not seem to pit so badly as those that were made by the hand mallet and they do not become rough on the surface. I do not know why, unless it is due to the uniformity of the blow. I suspect that is the case. The fillings I have inserted in this way retain the finish better than those I put in with the hand mallet.

Dr. G. Newkirk: I simply wish to say that Dr. Noyes has had considerable experience in filling steel matrices with Dr. Black, and I think he can give us some pointers.

Dr. Edmund Noyes: I made only two fillings in steel tubes; that is the extent of my experience. One of them was made with a fine point and with very heavy malleting and the minutest care, with a result which made the filling material heavier than the corresponding lump of gold run into the ingot, but not quite so heavy as can be obtained by passing gold through heavy rollers. The other one I made as rapidly as I could with much larger points, and a result that was less satisfactory upon the surface. I cannot give the details of relative appearance and weight, and nothing that I could say about it would add anything to the significance of this discussion. It has been suggested once with a great deal of truth I think, that the packing of gold against a smooth and flat surface, like a glass matrix, or into an angle like the one represented in such a cavity, cannot possibly be done best with a round point. It is a matter of mechanical stupidity to say that as good work can be done against a flat surface or into a sharp angle with a round point as with a square one. If you have a round hole to put gold into you may use a round point with which to put it in there. If you have a flat side you want a flat sided plugger to fit against it, if you wish to get close adaptation.

Dr. W. H. Taggart, Chicago: I wish to controvert one assertion Dr. Smith made in regard to the use of one instrument for packing gold, and that was the rapid blow of the instrument. There are some arguments against it, but I think when one becomes conversant with the uses of the instrument, the objections dwindle to nothing. The modern kinetoscope, which gives us a continuous moving picture, is made upon this plan. We get the idea of the moving picture from the fact that the eye is capable of receiving so many impressions per second; in other words, the optic nerve is capable of receiving forty-two impressions per second, and when it does this it gets to be a moving picture or figure. You take in the direction of vibrations in other ways. One set of vibrations causes a noise, a disagreeable sound; a higher number of vibrations will cause a musical sound, which is pleasant to listen to. Now, let us take the matter of malleting gold into a tooth, and we find a certain number of slow blows will create an impression of discomfort every time. Increase the rapidity of blows enough to get rid of the disagreeable sensation. If you hit ten blows instead of one, you get ten times that amount of discomfort; but when you go beyond, where the nerves of sensation are capable of carrying individual impressions to the brain you get a pleasurable sensation, rather than a disagreeable one. You carry the impression to the nerve, and the nerve becomes paralyzed, so to speak, and is unable to carry the sensation of discomfort to the brain, on account of the number and rapidity of the blows. Take a mallet and run the number of blows up to two or three thousand per minute, and it will not give so much discomfort. The pain is nothing. The pressure is more steadily given, and there is no possible chance for the patient to describe the individual blows. It is a good idea to fix the attention of the patient on one particular point, as for instance, tell him to try and count the number of blows, and in this way he will get rid of the discomfort. A statement like this may seem a little foolish to some of you, but there is some good in it. If your patient cannot count the blows, ask him how near he can do it. Fixation of attention will draw their minds away from the disagreeable part of the work and the noise, and the vibration becomes comparatively nothing.

Dr. Edmund Noyes: If I remember correctly, the essayist stated distinctly it was not his object to find out what sort of sur-

faces and margins we got to our fillings, but to find out approximately what sort of adaptation we could get to the interior walls and corners of cavities which are out of sight. In doing this he has undertaken a task which is more difficult than the one which we have practically, against the angles of cavities, because the surface against which the material comes has a sharper angle both at the side and bottom, and it is questionable whether it were easier to make a perfect adaptation against a smooth surface of glass or steel, than a smooth surface of dentine. His task was a more difficult one than a practical operation in a tooth, certainly in regard to the sharpness of corners and angles, which are the things a photomicrograph brings out distinctly in the picture.

Dr. Garrett Newkirk: I wish to suggest that probably a larger and flatter instrument for condensation would have produced a more even result than a fine pointed, choppy instrument did. That seems to be indicated by his own description of the instruments used. None of the instruments were really coarse, but the larger ones produced the best results.

Dr. Smith (closing the discussion): In the first place I want to express my sincere thanks to the gentlemen who have discussed my paper for the kind manner in which they have handled my subject. My object in bringing this subject before the society was to get as free a ventilation of it as possible, and I had no idea what a task I had undertaken.

Dr. Johnson was especially kind in his remarks, and I want to thank him for them.

Regarding the remarks of Dr. Nyman, if it is not proper to make a cavity margin as near a right angle as you can possibly get it, then the teachings of Dr. Black, Dr. Ottolengui and others heretofore have been wrong. In regard to the amount of gold used in a particular cavity, or more in one than in another, I must say that the suggestion of Dr. Nyman in regard to accurate weight is a point that I fully appreciate.

I had no idea of the amount of work necessary to make all of these fillings, or the delicate manipulation required to pursue these investigations.

In regard to the discomfort and fear of patients in connection with filling teeth by hand pressure, I do not believe any of us should do these operations until we have gained the confidence of our patients, which is a thing we must have before we can do any-

thing. My patients have no more fear of my instruments slipping and lacerating their mouths than they have of not getting their bill.

Relative to the sense of touch, Dr. Nyman looks as though he might have been a most expert oarsmen and a credit to any crew that ever rowed, but with all due espect to him, I do not think that the strongest man who has ever wielded a hammer or sledge would tire me out in putting in fillings with hand pressure. I have warts on my fingers where my instruments come simply from long-continued exertion, but it took me some time to become accustomed to this kind of manipulation.

The Bosworth mallet is a most excellent instrument in some cases, but it is not adapted to fillings in the buccal surfaces of third molars such as I had especial reference to.

In regard to Dr. Taggart's remarks and his illustrations with reference to the modern kinetoscope, I will say that as yet we have no means of determining how many vibrations or beats to the second it will take in hammering gold before nerve sensibility becomes numb. This brings me back to what Dr. Johnson said, namely, we must investigate this thing, and find out how many pounds of pressure it will take by each process to reach a certain degree of condensation. I am appalled at the inadequacy of my results. They show very little and have established nothing conclusively. I have simply ventilated this subject and ask you to think about it. I thought I knew something about this once, but I see now that I do not.

With reference to the condensation of gold, as far as I have been able to judge, in our practical work in the mouth, we get holes in our gold, no matter what form of instrument or condensation we use. We are going to figure this out some time and it seems to me we are going to get definite knowledge on the point as to whether it is best to have a few big holes, or whether it is best to have a lot of little ones. (Applause.)

THE RELATION OF THE TEETH TO THE LIPS AND FACE.

By A. O. Hunt, D. D. S., Chicago, Ill.

By close observation and careful records, phrenology and physiognomy have been brought to such a stage of perfection, that by the outlines of the body combined with its movements, it is possible to tell the character and disposition of an individual, as well as what those characteristics fit them for in the way of occupation. Palmistry also, by the same careful observation and correct records can make some very close guesses as to those things which govern an individual, both past and present, by the lines, the hills and mountains as seen in the palm of the hand, in the shape and outlines of the fingers and thumbs.

Art and sculpture have by the same means been enabled to fix a classical standard of the ideal shape of the human form as seen in the external outlines on the surface of the body, exhibited by the position and action of the muscles. There has also been established a definite relation as to size in the circumference and length of parts of the body, as compared to each other.

The distance between the eyes, the length, width and position of the eyes, length of the nose, size of the mouth, etc., etc. And yet these features are so affected by their surrounding conditions, that the human family is divided into five distinct races of people, and again for reasons into tribal and national characteristics, still retaining all the essentials of the human form. Wherever the study of the human form has been specialized, both anatomy and physiology (form and function), have been well considered. It has engaged the best minds, and produced an extensive and valuable literature, such as Darwin's Expression of Men and Animals, Rimmer's Art Anatomy, various works on phrenology and palmistry, etc., etc.

The subject here presented is one that I have been investigating for a number of years and demonstrated repeatedly the conclusions arrived at in a practical way in the field of prosthetic dentistry.

This investigation was based upon the belief that if the parts of the body had so many fixed relations to each other that other specialties had found a basis upon which to build, that the teeth must also have a definite relative position to other parts of the head and face. If this could be shown it would relieve the dentist of many discouragements and assist the beginner in mastering the most difficult operations with which he has to deal. Instead of being obliged to wait for eight or ten years, or it may be longer before he begins to feel any interest in the work, or confidence in himself in the field of dental prosthesis, a set of principles might be established as a basis, so correct that he could proceed intelligently in the construction of an artificial denture, and without fear as to the final results.

The methods followed by which the conclusions were reached as presented for your consideration, was to make sets of plaster models of all classes of natural dentures, making at the same time, and of the same individual, two plaster casts of the lower half of the face; one with the features absolutely at rest and one where the teeth were closely occluded, both being essential in the study of the subject. The casts of faces made in these two positions show some widely varying conditions.

Our interest is centered more particularly in the lower fourth of the face, or the maxillary region where most if not all of the muscles of expression concentrate.

The lips will demand our first consideration. I do not think it necessary to take up in detail each muscle and its function. You are all quite familiar with this. Into the orbicularis oris muscle anastomose all the elevating and depressing muscles; in the upper lip all but one are elevating muscles; in the lower lip all but one are depressing muscles. In the case of the one, the depressor alæ nasi of the upper lip, it is not so much a muscle of depression as one of eversion and inversion; that is, it will move the lip inward or outward, but not downward to any extent, while the elevating muscle of the lower lip has a very great function. In other words, it is with difficulty that the upper lip can be forced down over the lower lip, and in some cases it cannot be done at all; while nearly every one can raise the lower lip over the upper one; sometimes to the extent of touching the base of the nose.

The lips assume many forms. The full lip, the thin lip, the flat lip, the pointed lip, the full upper lip and thin lower and vice

versa. In fact the great law of variation is as constant here as elsewhere, and yet the change is never so great as to destroy the identity of the human characteristics.

The various changes of appearance are more apparent than real, as this appearance is controlled mostly, if not wholly, by the position of the teeth and shape of the alveolar process behind them. In following this investigation, if one expects to come upon anything that may be regarded as typical either in the arrangement, size, form or occlusion of the teeth, they are doomed to disappointment; outside of the fact that they are human teeth and cannot be mistaken, there is nothing else typical.

Let us first consider the cuspids, the most important of all. They have a position distinctively their own, and but little variation is observed in that respect. In their development the position of the follicles are above the line of the follicles of the incisors or bicuspids. Their position is directly underneath the alæ of the nose, between the fibers of the levator labii et alæque nasi and the levator labii superioris. In the process of development and eruption they retain this position between the muscles, and when finally in position the cusp or point is in a line with, and directly underneath, the outer margin of the alæ of the nose. The only cases where this is not true (and they are rare) are whereby the premature eruption of the lateral incisor and first bicuspid the two latter have come into close contact at the interproximal space. If, however, this contact is not close and there is room enough for the wedge-shaped lingual side of the cuspid to gain an entrance, the cuspid assumes its regular position, crowding the incisors and bicuspids either within or without the arch, or in some cases causing them to rotate in their alveoli.

Another instance where the variation may occur is where they erupt in the palate bones, or they may be locked within the arch by the occlusion of the opposing teeth.

The mesio-labial margin usually forms the turn of the arch. The labial surface is presented mostly to the buccal aspect. The central and lateral incisors, unless some of them are abnormal in size (which is not unusual) occupy the space between the cuspids. The variation in the relative width of the incisors is shown by the common irregularity as to alignment. It is very rare not to find them either slightly within or without the arch or some of them rotated in the alveolus.

The position of the bicuspids is that they are nearly hidden behind the cuspids, if the median line is taken as the center of vision. In every movement of the levator anguli oris and the risorius muscles, inward pressure is brought to bear on these teeth. This pressure is augmented by the action of the levator and depressor anguli oris muscles, as well as by the anterior margin of the buccinator, in the act of opening the mouth. As the molars develop and erupt with the growth of the maxillary, they are farther removed from the action of so many muscles which changes the conditions materially. They are at liberty to follow the law of individuality which dominates all forms, and thus arrange themselves according to the temperament, whether basal or mixed in type.

The levator menti inferioris, the depressors labii inferioris and depressors anguli oris in the interlacing of their fibers present analagous forces to the muscles of the upper lip and cheeks, which operate to keep the inferior cuspids in their normal position.

The inferior teeth are not so likely to be malpositioned when the superior teeth are in their normal places, except at the time of the eruption of the third lower molars.

In considering the lower teeth, we find that the central incisors are always the length of the lower lip when the face is at rest. This is not likely to be the fact in the relation of the upper lip and upper teeth. Any unusual growth of the intermaxillary bones or a roundness or fullness to the superior alveolar border will cause what we call a short upper lip. The lip is shortened because when it is lifted above the rounded or full border of the process there are no muscles that readily act to bring the lip down over it; so much of an effort is required to accomplish this, that the individual rarely exercises it. The result is, that many persons do not close the upper lips when the face is at rest, while at the same time the teeth may be very nearly in contact and the occlusal margins of the superior central incisors are touching the inner edge of the lower lip.

The variation in the profile of faces requires that some standard be used to decide whether the lip and teeth are of the same length.

If an instrument be passed between the lips at the parting at right angles to the plane of the lower fourth of the face, it will touch the superior central incisors at a point corresponding to the

occlusal edges of the inferior central incisors. If the teeth are separated slowly without disturbing the instrument or lower lip, it will be found that the point of the instrument will indicate the length of the lower teeth as stated.

The relation of the teeth to the lips and face are of such a positive character, that there could not be a good and beautiful face without a correspondingly good arrangement of the teeth. It is possible for a close observer to tell by looking at the outlines of a face without seeing the teeth, as to whether any of the latter are missing or out of position, and which ones are so.

If in the construction of artificial dentures the principles as presented are noted and marked upon the wax used in taking the "bite" and such other notes made as cannot be recorded on the wax, the element of guessing will be eliminated and the years of experience to obtain a good result will be shortened materially.

We have then the following as a summary :

When the face is at rest, the teeth are slightly apart.

The occlusal edges of the central incisors are touching the inner margin of the lower lip.

The cusps of the superior cuspids are in a line vertically underneath the outer alæ of the nose.

The length of the lower incisors is the length of the lower lip.

DISCUSSION.

Dr. Geo. E. Hunt, Indianapolis, Ind.: I have been very favorably impressed with Dr. Hunt's paper. It is a valuable scientific and practical contribution to our literature. Science is a systematic arrangement of facts and that is what the doctor has presented here this evening. The three salient points in the paper are first, locating the superior cuspids anatomically instead of relatively to the centrals; second, locating the incisal edge of the four anterior inferior teeth—a matter of great practical importance; and third, placing the bicuspids well behind the cuspids for scientific and not for empiric reasons.

This paper is an important one and I regret that I did not have an opportunity to read it before this evening in order that I might discuss it in the intelligent manner that it deserves.

Before sitting down I wish to thank the members of the Illinois State Dental Society for the feast of reason and flow of soul, especially the flow of soul, that has prevailed here for the last two

or three days. I have thoroughly enjoyed my visit and to me this has been an exceptionally good meeting. I especially admire the fraternal feeling that exists among you; that frank admiration for the earnest efforts of your colleagues that finds such open expression on the floor at this meeting.

Dr. C. S. Case, Chicago: I was very much pleased with the paper. I knew I would be before it was read, for various reasons. One is, I am very well acquainted with Dr. Hunt, and I know that he has given this particular line of work much thought, energy and ability, and I have almost always found that when a man of ability devotes his time to one particular subject or branch of work he develops something more than the ordinary. He has handled this subject in a very able manner and along the lines that have characterized this meeting. He has brought out some ideas that have never occurred to me before, and I do not know whether they are true or not. I did not know before that there was such a universal typical relation between all types of faces as he seems to think. I am quite surprised to learn that the lower incisors have always the same relation to the line of the parting of lips, although I have been aware for some time that the upper incisors vary very much in their relation to the upper lip. The harmony which he seems to think universally exists between certain muscles and features of the face and the teeth, is something that may be true with many people, but it strikes me that there is a greater difference between the harmony of the middle features and the upper teeth than he has expressed. Very many cases of irregularity of the teeth are due to the inheritance of inharmonious types, and I have seen many cases where patients seemed to inherit very large teeth from one parent and very small jaws from the other, and the small jaws seem to be in harmony with the main features of the face while large teeth were entirely out of harmony. But of course those were cases of irregularity and not of the usual forms. In the construction of artificial dentures it is proper to follow what we may consider the usual forms, and it is a good thing that we have a man who has brought out the relations of the teeth to the external features of the face. As dentists, we have not been thinking of the face at all; we have been looking into the mouth. Our occupation is continually with the teeth and upon teeth, and consequently it has led us to concentrate our thoughts on the teeth alone. We rarely look at the face. In the construction of arti-

ficial dentures it is necessary to study the features of the face in order to arrive at anything like perfection.

Dr. HUNT (closing the discussion): I have simply enunciated four principles in my paper, and I trust all of you will feel interested enough to follow up the subject.

In regard to the orbicularis oris muscle and its relation to the movement of the soft tissues, I refer you to a paper by Dr. Barrett, read at the American Dental Association last year. It is a very carefully worded description of the orbicularis oris muscle and its relation to the other muscles of expression of the face. I do not want you to get two subjects confused. The paper as presented to you has nothing whatever to do with irregularities. Dr. Case will take care of that subject thoroughly; it has to do, however, with the position of teeth of normal dentures in the mouth, not irregularities. They are all irregular, if we take our ideal of arrangement as a standard. On investigation it appears that there is no such thing as a typical arrangement of teeth. Some of the teeth are out of alignment even in cases that we call normal. That is one of the principal features I dealt with in my paper. The best condition for a study in normal denture is where the teeth are all, or nearly all, in place. A great many in listening to others have their lips apart. The upper lip is not in contact with the lower. When not thinking about it they do not close the lips. These are variations. You will be surprised when you look into this matter to see how many people there are whose lips do not close together when the face is at rest. As you walk along the street you will notice that a large percentage of the people have their lips apart.

In regard to the changes that may occur from abnormal conditions, such as adenoid growths, enlarged tonsils, mouth breathing, etc., these are diseased conditions, and my paper did not dwell upon them. When we construct an artificial denture we do not want to reproduce the abnormal condition, but a better one if possible. The object of my paper, as I have endeavored to present it, is to study the best conditions of normal dentures in mouths where there is no disease particularly. Fix again in your minds the four principal points, making allowance for the fact that some expose the lower more than the upper teeth, and some the upper more than the lower. Some use the upper lip in speaking, while others use it much less. Wherever you place your

upper teeth, keep in mind the relation of the teeth to the lip. There is very little movement to it.

In taking the bite, make landmarks and notes of the characteristics you observe in faces, to be used when you make artificial dentures. In relation to prosthetic dentistry, some one said to-day that he was glad it was receiving more attention. Did you ever think of it, that you can almost count the experts in this department on the fingers of one hand? It is not strange at all that this subject has been neglected, simply because it requires a broader field of thought, broader effort, and indeed a better knowledge of the collateral sciences in order to get established in your mind a basis upon which to build, than in any other operation that we are called upon to do as dentists. It has always been called mechanical dentistry and thought of as such. The results you want to obtain are entirely outside of the field of mechanics, and mechanics do not apply to the results, only in the methods of putting the materials together. The human form is not a machine that is put together like an engine. It is put together in a certain way, with varying modifications. This is true also of the relations of the teeth and lips to each other. These variations are constant. Each case requires special care, special study, effort and observation as to the relation of the muscles in what we call their normal position. It required the dissection of more than twelve hundred cadavers to find out the normal position of the arteries in the human body. These variations are still present and confusing, with all the knowledge we have of anatomy.

PRACTICAL THINGS IN DENTAL PRACTICE.

By J. G. Templeton, A. M., D. D. S., Pittsburg, Pa.

To speak of and illustrate practical operations in dentistry, many methods are often suggested, one of which we select as the best for our purpose in the performance of each or all parts of our work.

In our effort to describe "practical things in dental practice," what we have to present is in a fragmentary form, without any connection of one portion with another our aim being to give briefly the methods we have found to be most useful in our daily practice, trusting that some of the younger men may have their attention called to some things, that may be useful to them hereafter; some of the things we shall present have been obtained from members of this society (to whom we shall give due credit); and if we fail to interest some of those present, such ones are respectfully requested to listen for the sake of those who have not heard as much thunder as some of us have.

To make moisture tight gutta-percha fillings: Dry the cavity well, place in it a pellet of cotton saturated with absolute alcohol, remove the cotton and with a warm air syringe evaporate the alcohol, varnish the cavity with a solution of common resin in chloroform, warm the gutta-percha and pack with a cold instrument; heat a thin-bladed instrument and pare off the surplus gutta-percha; any further trimming or polishing required may be done with oil of cajeput.

If these directions are carefully followed your gutta-percha fillings will be absolutely moisture tight; notwithstanding anything that has or may be said to the contrary.

To protect from thermal changes, particularly in deep cavities where the pulp is not quite exposed, first dry with bibulous paper, then apply on a small pellet of cotton absolute alcohol, which has a strong affinity for any moisture that may be left in the cavity or open ends of the tubuli. When the cotton is removed evaporation takes place rapidly, leaving the cavity perfectly dry. Now

varnish inside of cavity to near the margin with a solution of common resin, in chloroform, or of gum sandarac dissolved in sulphuric ether; then take a small piece of asbestos felt, moisten with pure wood creosote, campho-phenique or oil of eucalyptus; cover the side to go next to the pulp with a mixture of iodol, oxide of zinc and vaseline. Now place over the bottom or that portion of the cavity nearest the pulp, now over this place a thin piece of lead or a thin piece of aluminum plate, which will prevent pressure against the bottom of the cavity while inserting either a gold or other metallic filling.

It is our humble opinion that the old-fashioned, bur drill and excavator should be used more than they are in the preparation of cavities instead of relying entirely on the burring engine as very many do.

The engine and the sharp bur may be very satisfactory to the operator, but very much less so to the patient.

TREATMENT OF PYORRHŒA ALVEOLARIS.

This is a term used to name a condition of the gums frequently seen, and with which the writer has been battling since 1866, which was before any of Dr. Riggs' writings were published. During the last twelve years the amount of writing that has been done on this subject is quite voluminous, and the most of it reminds me very much of the steam that is seen emerging from the top of an escape pipe. The most valuable contribution on this subject is to be found in the American System of Dentistry, Vol. I., and which was written by our esteemed friend, Dr. G. V. Black.

The writer's treatment for this trouble consists of thoroughly removing all deposits and then applying finely pulverized sulphate of copper, which is caustic, astringent and stimulating. It has been my observation for many years that the most aggravated cases of this disease are found in the mouths of those persons who never eat pickles or anything sour, hence we are in the habit of recommending their use at meals and also the free use of lemons and oranges. In my humble judgment all such patients should be impressed with the importance of adopting an anti-scorbutic diet.

PLACING RUBBER DAM ON LOWER FRONT TEETH.

A slip-noose can be put on the lower front teeth with one hand, while the rubber dam is held down with the other; get the

slip-knots ready first, draw them tight, and they will hold as long as wanted.

TRIMMING RUBBER PLATES.

In finishing plates always trim the rim low over the bicuspids, leaving it high as can be worn over the cuspids and the same over and back of the second molars; do not file rim to a knife-like edge, slightly bevel inside of rim at the top, extending down about three-sixteenths of an inch.

TO MAKE PLATINUM GOLD PLATE.

To make platinum gold plate, melt with blowpipe pure gold on a piece of platinum and roll to the desired thickness; the result will be as good as any you can buy.

GOLD SOLDERS.

Take a United States $5.00 gold piece, 20 grains coin silver, 10 grains pure copper, 6 grains English toilet pins, melt the silver and copper together first; after melting this and the gold together, add the pins, flow into an ingot and roll, cut it into small pieces and melt again if it should not roll well first time; this will give a solder a little more than nineteen carets fine, and flows nicely on coin gold, being the same color.

TO SOLDER CAP ON GOLD CROWN.

To solder a cap on a gold tube intended for an artificial crown, lay the cap on about a tablespoonful of finely cut asbestos, put the tube in place on the cap, drop in the solder and a little powdered borax, then blow a yellow flame all around the tube until the solder flows, and there will be no danger of melting the plate.

POLISHING INSTRUMENTS.

To keep instruments polished, use a material sold in wholesale jewelry houses under the name of diamantine; the method of using is to place a small quantity of the powder on a piece of thick spongy sole leather and rub the instrument on it, when it will soon take on a fine polish. This so called diamantine is nothing more nor less than oxide of zinc, and can be bought in a wholesale drug house much cheaper than anywhere else.

To keep the rubber dam from jumping off a lower molar tooth, tie a small bead in the thread to be used as a ligature and

apply around the tooth so that the bead will come on the lingual side of the tooth, and thus frequently avoid the use of a clamp, which is not admired by many patients.

PERFECT IMPRESSION FOR PARTIAL UPPER PLATE.

To take an accurate impression of the mouth for a partial upper set of teeth, smear plaster over the roof of the mouth with the finger, take a string about one foot in length, tie the ends together, put the tied end of the loop into the plaster on the roof of the mouth and add more plaster to thoroughly imbed the knot, leaving the loop of the string hanging down. In placing the plaster in the mouth care should be taken to have it come full half way over the grinding surfaces of molars and bicuspids and cutting edges of the front teeth; then trim the plaster and varnish the trimmed surfaces. The plaster should be so trimmed that it will fill up fully one-half of all spaces between the teeth; then cover all the remaining surface of the mouth and teeth with plaster, being very careful to have the teeth well covered and spaces filled in, putting on plaster for the buccal and labial surfaces. When set, the plaster impression readily parts where it has been varnished, the palatal portion is dislodged with the help of the string used, and the pieces are then placed together and the model made. If a tooth is irregular use modeling compound about it and trim suitably; then apply the plaster. When removing it breaks where joined; then remove compound, place in position in the impression and pour the model.

MODELS OF MARBLE DUST AND PLASTER.

In vulcanite work the best results may be obtained by making models one-fourth marble dust and three-fourths plaster; also same in flasking the case. The best plaster that I have ever used is that made by Mr. Higginson, at Newburg, N. Y. In the humble judgment of the writer the best and sharpest models are made without using varnish of any kind on the plaster impression; instead lather the impression with soap, which is readily done by wetting a camel's hair pencil and rubbing on a cake of soap and applying to the impression until it is covered, and then set it in a basin of water for a few minutes until the plaster has absorbed all the water it will take, when it should be held under the hydrant

for about a minute to wash off the excess of soap; it is now ready for pouring or filling with plaster and marble dust to make the model, which when it has set sufficiently, can, with the exercise of a little care be separated as nicely as if a thick coating of varnish had been used. In this way a sharp model can be made without obliterating any of the fine lines of the impression, which is one of the little things that should always be attended to at the proper time.

In all operations in dentistry it always pays well to attend to the little things at the proper time.

TO DUPLICATE MODELS AND IMPRESSIONS.

Take printers' roller composition, melt in a water bath until dissolved. Grease the model slightly with lard, and place it the same as if to mould a metal die, cover with a metal ring (a tin can opened at both ends will do), and pour the melted composition over the model. Let this stand over night. By morning the material is hardened and the model can be withdrawn. The composition being elastic it retains its shape, and a hundred models may be poured if necessary. Printers' ink rolls are made from glue and molasses.

Having to make a full upper set of teeth, we will suppose the impression and model to have been made in the usual way. Take modeling composition, soften and flatten it out until it is about a quarter of an inch thick; press it on the model while warm, and then cut and trim to make a trial plate for the purpose of taking a bite. It should accurately fit the model. Melt a little wax around the ridge, then press a roll of softened wax on that, and trim to what you think would be a sufficient length, then try in the mouth and carefully trim the lower edge to the proper length for the teeth; if you find that it is not as desired, either add to or cut away until it is found by trying in the mouth that the wax represents the proper length. This wax should be so cut on its articulating surface that all the lower natural teeth will strike at the same time when tried in the mouth. Now remove and soften the articulating wax surface just a little over the flame, then replace in the mouth, and do not let the patient bite into it until you have the head drawn well back, so as to put the interior muscles of the neck on a stretch; then have the patient bite a little on the wax, just to get an impression of the cusps and cutting edges of all the

lower teeth. Next take an accurate impression of the lower teeth, from which make a plaster model, which will fit into the slight impressions of the teeth made in the bite taken, and then place the whole on any good articulator which can be set to maintain the relative positions. Fasten the set screw, remove the bite and you are ready to set the teeth to a correct articulation, and if all has been carefully done the teeth will come together without any subsequent grinding.

For a double set (upper and lower) make trial plate of modeling composition to take the bite on, putting a piece of rather stiff wire in the lower one to stiffen it. Wax the ridges as previously described. Place a roll of softened wax on the upper trial plate, place the lower trial plate in the mouth, being careful to see that it is in its proper place, and hold it there while putting in the upper plate with the wax on it. Do not allow the patient to bite until the head is thrown back as far as you can get it; then tell the patient to bite, and keep the jaws closed until, with one finger, the wax has been well pressed on to the trial plates. Mark the centre or median line on the wax. Have the patient close the lips, and then take a small straight instrument and mark on the wax the height of the lower lip. This mark should extend from one angle of the mouth to the other; you then have the line of fissure or line of lip closure; in other words, the height of the lower lip and length of the upper to serve as a guide in making the wax models. After thus taking the bite, place each of the models in the bite so obtained, and fasten in any good articulator; then prepare the contour wax models, which should be tried in the mouth to verify their correctness. They should come together in the mouth the same as on the articulator, and if they do not they should be made to do so before proceeding further. Take pains to be satisfied that the wax models are correctly adjusted and give a natural expression to all the features, observing that the lower third of the face is in the proper proportion or length with the upper two-thirds, and be sure to produce the proper fullness over the region of the upper cuspids, to give as near as possible the natural contour. Then take the upper and lower plaster models off the metal articulator, and make a plaster extension to the back part of the upper model, on which place the wax models, which have been marked while in the mouth. The lower plaster model is placed in position, and a plaster extension added to fit to that of

upper plaster model. After separating these, the lower wax model is placed on the lower plaster model, and the inside space filled with wet paper, and plaster is poured over all to make the lower articulating plate to which the lower teeth are to be set. Next place the upper model in position, and set the upper teeth to the lower ones which have just been set to the lower articulating plate, and when ready for flasking, if for vulcanite plates, saw off articulating ends. In setting the teeth always set the lower teeth first. And in setting the upper teeth to the lower ones, set the bicuspids first.

Having made double sets in this way for twenty-seven years, without having to do any grinding after placing them in the mouth, the writer thinks that he has some claim to the conclusion that this method is a pretty good one.

When making an upper plate to articulate to lower natural teeth, always take an impression of the lower teeth, and in taking the bite have the wax trimmed to show the length you wish the teeth to be, and bite into it just sufficiently to show the tips of cutting edges and cusps, where the model made from lower impression can be placed in proper position, etc.

To keep rubber from running between the teeth and joints in vulcanizing, after the teeth are set in the first half of the flask, the plaster trimmed and varnished, pour water on all the teeth and joints, then mix a small quantity of pure plaster; have it rather thin and with mixing spatula cover labial and buccal surfaces, also joints, take up the piece quickly and bring it near the mouth and blow rather sharply against the thin plaster all round, which will force it into all spaces between the teeth and blocks. After this finish flasking in the usual way and, if possible, it is well to allow the case to remain over night in the flask before packing.

To prevent plaster from adhering to the palatine surface of rubber plates, coat the model with a thick lather of soap just before packing the case.

To make rubber attachments adhere to metal plates (particularly gold), without punching holes or soldering pins and staples, clean thoroughly that portion of the plate to which the rubber is to be attached, using alcohol and chloroform to remove all wax or grease. After that scratch said portion over with a piece of new and clean sandpaper, next etch up the surface with a graver, being always careful never to touch it with the fingers or to blow

the breath on it. Now with a hot spatula spread small clean pieces of vulcanite over the etched surface, using considerable amount of force until all of said portion of the plate is covered with the rubber, then finish packing the case in the usual way. When the piece is placed in the vulcanizer take half an hour to raise to 212 degrees, and from that point take three hours to raise to 320 degrees, after which allow it to cool slowly.

The greatest and most needed improvement in our profession to-day is in the line of prosthetics. In this age of progress of the arts and sciences of which so much has been said and written, and which we like to apply and hear applied to our profession, the writer is inclined to think that we can justly boast of our progress in everything else.

But alas, when we see wherever we go so many evidences of the low standard of this branch of dentistry, such disfigurement, such utter failure of any artistic skill without the appearance of any effort to restore the features. These false teeth are grinning at us at every turn. False did we say? Yes, false teeth everywhere; on the street, in the car, at church and in the social gathering. Their false appearance asserts itself like a horrible ghost, while the unsuspecting victim seems to enjoy their hideousness. Many of these miserable looking so-called substitutes have the magnificent hue or shade of well-watered skim milk, and looking about as much like human teeth as a row of small white beans set in the shape of a horseshoe.

If the poet or the musician could furnish nothing better, their occupation would soon be like Othello's. Now, what is needed is a systematic effort to instruct the people that they may know what prosthetic dentistry can do for them. When they know or realize what an artistic denture is, there will be no difficulty in receiving ample compensation for it. No wonder artificial plates bring such a low price. They all look alike. Those placed in the mouths of old people being taken from the same job lot as those inserted for the lass of eighteen summers, and for this reason the more intelligent people have a perfect horror of them, and do not want to pay much for them. Any dentist who has practiced for any length of time knows what a marvelous change can be made in the features of a patient by removing an illy adapted plate, and substituting for it one well adapted in all its requirements.

DISCUSSION.

Dr Edmund Noyes, Chicago: It has not been so common in recent years, as it was when I first became a member of this society, to have papers of this character read, namely, respecting items of personal habit and practice, details of operations, and the various methods of manipulation. I will not deny that the papers and discussions which we have now are of more importance, but if we could spare the time it would still be very useful for the young men, and for the old men, to listen to items of personal habit in practice, which are apt to be different with different men. In this way and with such persons, men are able to give us what we might call tricks of manipulation and detail in making operations and in using appliances.

Dr. Templeton referred to one or two points which will admit of a little more explanation. In the first place, in respect to the use of hand instrumentation as against the engine in the preparation of cavities and filling them. He simply intimated that it would be better for most of us if we used more hand work and less engine work. This subject should be elaborated in more detail, so as to discriminate as to just what work is best done with the engine and what is best done with hand instruments. I will say, to begin with, that no man can afford to allow himself to use the engine exclusively, because by so doing he would lose his skill and training in the handling of hand cutting instruments. In a general way, I should roughly express the opinion that dentine can usually be rapidly cut with the engine instrument, and the enamel can usually be rapidly split off or shaved with hand chisels. There are probably numerous exceptions, or some exceptions at least, but as a general statement I think you will find it correct.

In some of this work for the extension of cavities in sound territory for the safety of the operation which has been described and spoken of, it is my impression that sometimes it can easiest be done by a rapid undermining of the enamel, where we wish to extend the cavity, with a small and sharp bur in the dentine, cutting as little dentine as possible and getting rid of the enamel which is undermined by hand work with chisels, instead of trying to cut the enamel with burs. That is one suggestion. But there is a field here for somebody to work out scientifically, and, in fact, the whole question of instrumentation needs careful study and treatment; it needs much more attention than has been given it

heretofore, particularly with reference to the shaping of cavities in teeth. Dr. Templeton told you how to make a water-tight gutta-percha filling. It has been suggested as a part of this manipulation, that the great portion of the shrinkage of the gutta-percha takes place before its plasticity is lost, which implies that the instrument he speaks of using should be used for a little time until most of the ordinary shrinkage of the material is over, and the manipulation has gathered it into the cavity to overcome it. The essential thing relates to the adhesion of the material to the varnished wall, so that the shrinkage which does take place will pull in the surface instead of pulling away the margins.

He has told you something about how to hold the rubber dam with beads. The beads should be tied on the tooth before the rubber dam is put on; you can stretch the rubber down and get it over one first, then the other, and it will stay there, giving opportunity to force it down into the proximal spaces afterward. Not many of you will use these almost to the entire exclusion of clamps, as I do, but you will find in a good many cases that they will promote your comfort and that of your patient, and will abundantly pay for the enlargement of your resources by the use of them. The little white rounded porcelain beads are best. A glass bead is just as good, except for its transparency, which is not important. It should be round; and not broken off from a tube like those that were shown this afternoon. I will say, I heard some one in the room speak of the difficulty of getting them on. There are few teeth, even if they are newly erupted twelve year molars, upon which you cannot get a string with two beads, and tie it low enough so that it will stay.

One point in connection with what the essayist said about taking ordinary impressions when there are teeth remaining. In addition to the manipulation which he described, the teeth should be lubricated with vaseline or oil, so that the plaster will not stick to them. Probably you are all accustomed to do that. Able practitioners think about little details that may be of interest to other people, and as this is a subject upon which we should get points of interest from a great number of the members, I shall not consume any more of your time.

Dr. S. F. Duncan: Dr. Templeton spoke about the attachment of rubber to gold plates. He spoke of spreading it over the etched surface with warm instruments, if I rightly remember. The

benefit he derives from this is in keeping moisture away from the plate. I have found by taking ordinary vulcanized rubber and making a solution of it in chloroform and covering that portion of the plate to which I intend to make the attachment, it would prevent the rubber from pulling away from the plate at the margin—the grinning, as I have called it sometimes, we frequently see in plates of this kind. This has been more successful in my hands than any other method I have tried.

Dr. G. D. Sitherwood: I am very much interested in Dr. Templeton's paper. I have known him for a long time and have learned many practical points from him.

With reference to taking an impression in plaster for a partial plate, or in taking a full impression of the teeth, I scarcely know who is the author of that method. But I have learned it was Dr. Angle's method of taking an impression of the teeth, which consists of using a clean impression cup evenly filled with plaster leaving but little surplus, and wait until your plaster has set hard; then slip the cup off, it having been oiled slightly, leaving the plaster all in the mouth. Two grooves are then cut in the hardened plaster on a line parallel with the cuspid teeth, not cutting quite through. Then with a quick pry with a pointed spatula or knife the anterior piece is wrenched loose. The lateral pieces are broken off with the thumb and finger. The large piece covering the roof of the mouth may readily be worked loose. Then you have four pieces which are readily united.

I have sometimes thought that I could absorb more practical things from other dentists than any other man I know anything about, and could think of fewer things myself. I learned one thing recently while in Iowa from Dr. Peterson. Perhaps many of you know him. I will give it to you. In regulating teeth you often find the superior central incisors standing apart, especially where the lateral incisors are out of the arch. If you have a case of that kind in your practice, if you will go home and dry these teeth clean, then take No. 25 linen thread, wrap it carefully around the teeth three or four times and tie it, you will be surprised to find those teeth are together the next morning, or at the end of twenty-four hours. The philosophy of it is simple, the contracting of the wet thread brings the teeth together. It is the best method I have ever attempted in cases of this kind. The teeth, if they do not remain together, can be made to do so by mak-

ing little bands, soldering them together, cementing them on the teeth, and you will have no further difficulty.

Dr. C. S. Case: As early as 1882 or 1883, in the University of Michigan, students were taught to take impressions of mouths, similar to the method described by Dr. Sitherwood. Removing the impression cup, leaving the plaster in the mouth, cutting sections in different parts, and breaking it away to be restored in the cup. This is not what the author of the paper intended to speak about, if I understood him. It was with reference to taking impressions in plaster in difficult cases for partial dentures. It has nothing to do with the other method at all and cannot be done in that way. I do not think it advisable to take an impression cup for full denture and fill it with plaster, put it into the mouth of any patient, with the view of removing the plaster by cutting sections. The way to do this perfectly is by taking it in the first place in sections. Any one with a little ingenuity can place plaster on pieces of thin lead or anything you please, adapted to the parts in sections, and take a sectional impression that will produce a perfect model of the parts, no matter how difficult or dovetailing the position of the teeth.

There was one thing said in the paper that I do not agree with, and that was the doctor's method of constructing solder composed partly of toilet pins or any alloy, the composition of which we do not exactly know. If we are going to do anything of this kind, why not do it on basic principles. Use chemically pure metals, pure gold, pure zinc, pure tin, pure copper, and put them together in proportions that will flow at a temperature a little below the the metal you are to solder.

Dr. G. D. Sitherwood: In reply to the remarks of Dr. Case, I only wish to say that I did not give my method of taking impressions or the other method of taking impressions in plaster and taking it away in four sections as being original or new. I stated that I have tried many methods more successful in my hands for taking such impressions.

Dr. Lowry, of Kansas City: I want to speak of one or two points that occurred to me while the gentlemen were discussing the paper, and first with reference to the use of clamps. A great deal has been said in this connection about the use of the bead versus the use of the clamp. I use clamps in my practice pretty largely for several reasons. I am very careful to select a clamp

that will fit the tooth that I expect to place it upon, one that will not impinge upon the gum. This can be done, the clamp holds the rubber out of the way. It admits more light upon the tooth or within the cavity than the bead method. The consensus of opinion seems this afternoon to be that the clamp ought to be supplanted entirely by the use of beads. I think the bead method is a fairly good one. In many cases it can be used conveniently; I use both and have for a long time. A small cube of ordinary rubber seems to hold the rubber down better than a bead; it is not so apt to slip off if applied to an upper wisdom tooth for instance. Rubber sticks to rubber better than to a bead. I use clamps with care, as I said before, the principal advantage to be gained is to hold the rubber out of the way and to admit more light to the cavity.

With regard to sectional impressions spoken of by Dr. Case, I have tried the method referred to; others may be more skillful than I in handling plaster of Paris. I find sectional impressions a failure; I have never seen an accurate fit made from a sectional impression. If I want a perfect impression, or as nearly perfect as can be procured, I use plaster of Paris, pure and simple, place it in the mouth and remove it before thoroughly crystallized; it thus breaks easily and a series of clean-cut breaks can be replaced more accurately, after it has become thoroughly crystallized than sections. Although it is old, it is superior by far to the sectional impression method.

With reference to the use of the hand instrument versus the dental engine, would say in my opinion the dental engine is used too much. I can make an undercut in a sensitive tooth with less pain with a sharp, hoe-shaped excavator than with the engine, no matter how sharp or how small the bur; never reverse the motion however. I use the force in one direction until finished.

Dr. Templeton dwelt longer on the subject of prosthetic dentistry than any other part of his paper, and I was glad for it has not recently been given the care, attention and significance that it deserves. A good prosthetic dentist must not only be a mechanic, but an artist of the highest degree as well as a thorough anatomist, especially must he know the muscles surrounding the mouth and their various functions. It requires more skill to construct a good artificial denture than it does to make a bridge or crown, or to insert a filling of any sort. A dentist must have a greater diversity

of qualifications in order to be successful in plate work than in most any other branch of mechanical dentistry, or of dentistry of any kind.

Dr. E. T. Brigham, Watseka: The few words I shall have to say will be in line with the subject of the paper and the discussion. The paper was somewhat assorted and the discussion seems to be in that line. I believe the right way to take an impression is to do it with plaster of Paris, pure and simple, letting it remain in the mouth, not until it is partially hard, but perfectly hard, so that it will break when you take it out. Another point. I do not believe we should use any oil on the teeth, or in connection with impressions to cause separation of the cast.

Dr. A. H. Peck: I will speak of one feature of the paper. The author spoke of the efficiency of sulphate of copper in certain diseases, but nothing was said as to how it should be used. I think this quite important. Sulphate of copper is a most useful agent in the treatment of pyorrhœa, and it is also a favorite of mine in the treatment of abnormal swelling of the gums from whatever cause. The gums are dried as thoroughly as possible and the copper applied by means of a piece of orange wood, whittled thin, which is first dipped in water, and passed into the copper, a quantity of the powder will cling to the stick; then pack the copper down between the teeth and swollen gums. You can use it freely. It is not necessary to exercise care as to the quantity of the powder to be used; let it remain there for two or three minutes, then with a syringe of warm water wash the excess away. You will be surprised in the course of two or three days' time, and also much gratified, to see the extent to which the swollen gums have been reduced.

Dr. Ira B. Crissman: At a recent meeting of the Chicago Dental Society, Dr. Fernandez described a method of using clamps on teeth which I think if universally used would get rid of the uncomfortable sensation around the tooth, and the tipping forward, pressing into the gum at anterior portion. He suggested that the points or sharp edges which ordinarily project and cut into the tooth structure be filed away and a small rubber tube be placed over the clamp, leaving the ends of the rubber tubing a little longer than the clamp to prevent it from tipping, which it so often does, and is very inconvenient and causing great pain. I think the suggestion is a good one, and if used would be beneficial

in everyday practice. A great many dentists do not use the clamp on account of the saliva clogging the mouth. This trouble can be obviated by the saliva pump attached to the fountain cuspidor. In conclusion, the clamp should not be used unless absolutely necessary, i. e., where it is difficult to keep the dam away from the tooth, and where the cavity is situated on the buccal surface, answers a good purpose to keep gum and rubber away from tooth.

Dr. Templeton (closing the discussion): In reference to the remarks made by Dr. Noyes concerning the use of hand instruments and the engine, I endorse all that he has said. I merely said that most of the dentists, particularly the young men, are using the engine entirely too much. I do not wish to have the impression made that I do not use the engine at all, because I do, and I would not like to be without it. I use a sharp excavator with a handle about six inches long. I learned to use it a good many years ago, and would not like to practice without it. I clean out my cavities with it. I use the engine in the preparation of a certain kind of cavities. If I want to cut out a fissure of some kind, or to cut tissue, I use the engine for that, with fissure drill or bur.

Dr. Duncan says in making a rubber attachment for artificial teeth to a gold plate, he prefers the use of rubber dissolved in chloroform. I have used this method myself; but prefer the one spoken of in the paper, with a warm spatula or knife to press it down with. It holds better. I want to say, gentlemen, that if you wish to attach rubber to a gold plate without soldering it or punching holes in it you can do it, but the plate must be clean and roughened with clean sandpaper. If you vulcanize it long enough, taking three hours to get up to 320°, and hold it there forty-two minutes and then cool slowly, you will find it will adhere to the gold plate.

Dr. Sitherwood said someting about Angle's method of taking impressions. That method is quite different from the one I described in my paper, although it is very good and I have used it many times, but as Dr. Case has very well said, there are cases where that method will not work, and in taking impressions for partial sets it seems to be the most satisfactory method that I have ever tried.

Dr. Case also said something about making solder, that if we

used coin or gold we would know what was in them. We would know just how much gold and how much alloy were used. The same way with silver. We know what is in United States coin, and say it is just as good when you know what is in it. The pins I referred to were English pins, made of fine brass and coated with a little bit of tin. American pins are mostly made of iron, and that is why I recommend the English pin.

Dr. Lowry spoke of the use of beads supplanting clamps altogether. That was not the intention of my paper. I use clamps sometimes myself and I use beads a great deal. If you do not have beads you can tie a knot on the ligature, three or four knots in the same place, and it will answer the same purpose. He also says that he has not been successful in taking partial impressions. I have succeeded a great many times in doing this. It does not take very long to trim it out, varnish it, apply more plaster, but if you get an impression this way you have a good one. You get a model which is absolutely perfect and you can make a plate that will fit up to the tooth.

Dr. Lowry spoke of causing pain by using the dental engine. Whenever you use an excavator or chisel always cut from the center, never toward it if you can help it. That is the reason why we hear so much complaint about using the engine; dentists cut toward the center instead of away from it.

Dr. Peck alluded to the use of sulphate of copper and he described my method exactly. I use finely pulverized sulphate of copper for this purpose and use it at as he describes it. One word about getting sulphate of copper for this purpose. Do not go to a druggist and have him pulverize it for you. Not once in a thousand times will they pulverize it fine enough. Get the sulphate of copper which is already pulverized for the trade as they have it in a jar on the shelf. It is pulverized into an impalpable powder, and that is what you want. One word about the application of it. Place a napkin or a roll of cotton or bibulous paper inside the teeth keep it off the tongue, apply it dry, wash it out with hot water; after you have used hot water in removing it from the mouth as much as possible, you can then take absorbent cotton, saturated with pure glycerine, introduce it into the mouth, and tell the patient to keep it there a little while. It will take the taste of sulphate of copper out of the mouth. One thing should not be forgotten. It is not a pleasant thing, that is, many people complain

of the taste, but do not complain of the results obtained from it. Use it in one case, get the patient to come back, and notice the result. Its caustic, astringent and stimulant effects will last five days, and it should not be applied oftener than this. It is an astringent to the capillary blood vessels, and its caustic effect destroys the secreting membrane. It is astonishing how rapidly you get results.

I thank the members very much for their attention in listening to my remarks.

PRINCIPLES OF FORCE AND ANCHORAGE IN THE MOVEMENT OF TEETH.

By C. S. Case, D. D. S., M. D., Chicago, Ill.

If there is one thing more important than another in the science of regulating teeth, it is a mind that is well trained in the simple laws of physics, with the ability to practically apply these laws to the invention, construction and management of regulating appliances.

In the voluminous literature and teachings upon the subject of orthodontia and dentistry in general, there is little to be learned of these most important basic principles. In our endeavor to become a great profession and completely disassociate ourselves as professional men from the fearful calamity of being classed as tradesmen and mechanics, there has been an unfortunate tendency to underrate the value of certain branches of knowledge that lie at the very foundation of dentistry, and which should form the only true basis to scientific training for almost everything we undertake as dentists.

In contradistinction to the course commonly pursued by most teachers in the department of orthodontia, I occupy no time in lengthy histories of cases in practice because I believe it to be far more important to train the minds of students : First, in certain broad and general principles relative to artistic and harmonious relations that will apply to all cases. Second, in the scientific application of force for every variety of movement of a tooth in any position; which will equip him from a mechanical standpoint for the movement of teeth, and finally for the complete management of the most difficult cases of irregularity. Certainly, this is the only true and scientific foundation for that display of individual thought and ingenuity which almost every case commands. He is now, if ever, able to invent something that will be applicable to the particular case in hand and which may differ in certain particulars from anything that has ever been used or ever can be used again. Furthermore, if correct artistic, physiological

and mechanical principles are employed for the regulation of teeth, results are quite as reliable as most things in exact sciences, and therefore teaching along this line does not necessarily require to be founded on the experiences of practice.

In my teaching I dwell at considerable length upon the laws which govern the activities of force and the mechanical advantages of different methods of applying it in the practical movement of teeth. I treat a regulating apparatus together with the teeth to which it is attached, as a machine. The best definition of a machine is that it is an instrument interposed between a moving power and a resistance or work, with the view of changing the direction of force or otherwise modifying it.

The important difference between an ordinary and a regulating machine is, with the former power and work are the only important factors. A manufacturer, or person engaged in the use of machinery, is interested as to how much wood or coal, through the medium of its product steam or electricity, will produce a certain result in the form of work; means for taking care of the force of reaction is amply provided for in the substructure or the inertia of the machine itself. Whereas with a dental regulating machine, power supplied by the operation counts for naught, while the factor, reaction on fulcrum and anchorage, referred to in Newton's Third Law of Force, is of the most vital importance. This law is: "To every action there is an equal and contrary reaction." And this equal and contrary force of reaction, which of necessity is sustained by other vital tissues, should be neutralized, either by reciprocatory action upon other irregular teeth that require movement in an opposite direction, or by so distributing this force through the medium of a static anchorage that it will do the least harm to teeth in proper position.

I said that I considered the teeth grasped by a regulating apparatus as a part of the machine itself—as levers, if you please, doing work principally upon the bony structure surrounding their roots.

The ordinary lever is a rigid bar or inflexible rod resting upon a fixed prop called the fulcrum and having power and weight disposed at some two other points. The different ways in which the three factors, power, weight and fulcrum, can be disposed, gives rise to three kinds of levers. (See Fig. 1.)

Here again, as with machines in general, physics in computing

quantities deals only with power and weight or work, exemplified, in the one general law of levers, i. e., "Power and weight are in the inverse ratios to their distance from the fulcrum." Nothing is said of the force of reaction or the force sustained at the fulcrum; whereas with a tooth considered as a lever the action at fulcrum, as will be shown, is quite as important to us, as at the points known as power and weight; and, moreover, it is important to keep in mind approximately the relation which it bears to these factors.

While it is never possible or necessary to accurately calculate

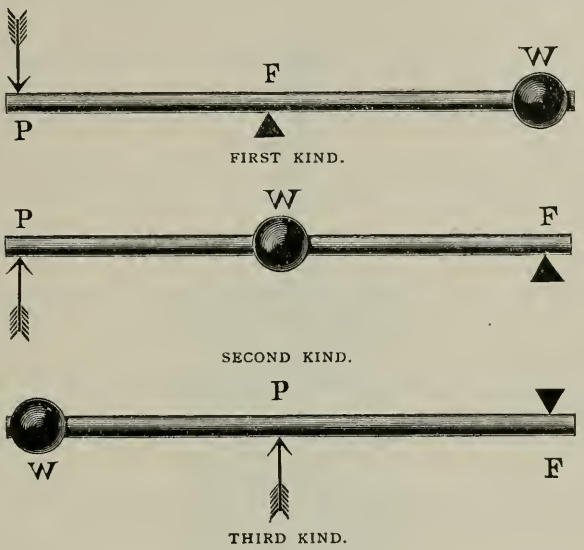

FIG. 1. LEVERS.

these quantities, still in order to arrive at the rough estimate desirable, a clear conception of the mathematical methods employed under the laws of physics, especially those relating to levers, is very important. This can easily be approximated with levers when we remember that the force exerted or sustained by that factor situated between the other two—at equilibrium—is equal to the sum of the other two, be it power, weight, or fulcrum. That is why a lever of the second kind is always chosen where great force is required at the expense of motion. Again, in the typical lever the fulcrum is always considered a fixed point, but we are aware that there are a number of implements employed in mechanics

that exert force according to the principles of levers, though in construction they differ in certain particulars from every one of the three kinds. Common examples of this are all forms of the "pulley, the wheel and axle powers." There is, furthermore, a not uncommon kind of lever in which points of weight and fulcrum, in their activities upon each other, are more or less interchangeable—both acting as a fulcrum for the other, with varying stability and relative energy governed by the velocity of the moving power and the relative length of the power arm. An example of a lever

Post Lever.

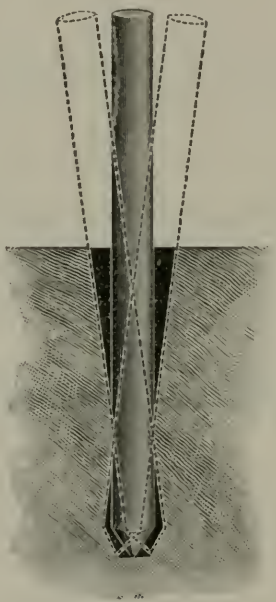

Fig. 2.

of this kind is an oar of a row boat. In proportion to the velocity of the moving power exerted by the rower, above the possibilities of the water to get out of the way of the blade, the oar becomes a lever of the second kind and the boat or work moves forward. But if the velocity of the moving power is not sufficient to overcome the inertia of the boat, the only work that the oar or lever can be said to accomplish is the movement of the yielding water in front of the blade, with fulcrum at the oar lock—or the action of a lever of the first kind.

If at any time you should drive a four foot post one-half its length into clayey soil of uniform quality, and then take hold of the top of the post and move it back and forth with a view of pulling it out of the ground, you would be working a lever which combines the qualities of the first and second kinds, or one like the oar in which the so-called areas of power and weight act as fulcrums to the other. (See Fig. 2). After pulling the post out of the ground, if it were possible for you to make a transverse section of the soil for the purpose of examining the shape of the hole you had made, you would find the upper two-thirds a V-shaped opening tapered down to the diameter of the post; the lower third spreading out to an inverted V. As the post was forced in one direction the soil in front of it along the surface area would become impacted or thrust to one side, the whole acting as a lever of the second kind with fulcrum at the lower end. At some point along its length, however, it would cease to move in the direction of the applied power—the very resistance of the soil over the surface area of work, causing it in turn to act as a fulcrum and the whole as a lever of the first kind with work or movement at the lower end in the opposite direction.

The reason that the upper area of work is twice that of the lower may be found in an examination of laws which refer to the relation of the three factors of levers. Considered as a lever of the first kind, if the fulcrum or surface area of the ground is exactly in the center of the post, the force exerted upon it would be equal to the sum of power and weight, or twice as great as that exerted at the lower end or area of work. Again, when considered as a lever of the second kind—weight or work now being between and at an equal distance from power and fulcrum—it would be forced to receive a pressure equal to the sum of power and fulcrum or twice as great as that exerted at the lower end or fulcrum area.

I am in the habit of illustrating these important principles to my students by examples of some simple forms of levers of the first and second kinds. The beam of balance scales is a lever of the first kind. The support or central standard is the fulcrum, with points of power and weight at the end attachments for the pans. (See Fig. 3.) It can now be seen at once that when the beam or lever is at equilibrium the fulcrum sustains the sum of power and weight, and this would hold true of any lever of the first kind at whatever intermediate point between power and

weight the fulcrum is placed. When the fulcrum is exactly in the middle of the lever, as with the example of the post lever, the fulcrum receives twice as much force as is exerted at weight and consequently the post would move through the soil at the surface of the ground twice as far as at the lower end in the opposite direction.

An example of a lever of the second kind may be a rod or pole supporting a weight carried by two men. (See Fig. 4.) If the points at which the two men—whom we may call P. and W.—grasp the pole are four feet apart, and the weight is a pail of water weighing thirty pounds swung in the center of the pole, each man would

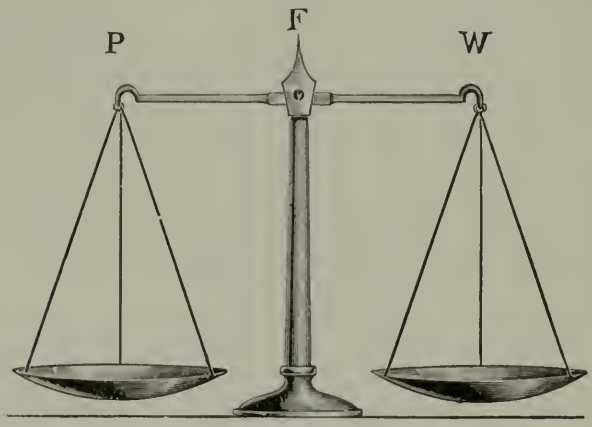

Fig. 3.

exert a force equal to fifteen pounds. In other words, the force exerted at W. exactly in the middle of a lever at equilibrium would be twice that at the fulcrum. Here, again, we have the same result as that shown by the action of a lever of the first kind.

Now, if you please, note the change in the relative magnitude of force exerted at fulcrum and weight when the length of the power arm is shortened. (See Fig. 5.) If P, grasps the rod one foot from the pail, we have a three-foot lever with P. exerting twice as much force as F., which may be proven by the rule of levers, i. e., "Power and weight are in the inverse ratios to their distance from fulcrum."

Power arm of the above lever—3 feet—is to W. arm—2 feet—as weight—30 pounds—is to P. or 20 pounds, which leaves 10

pounds to be sustained by F. Therefore, the force exerted at weight in this lever is three times that at the fulcrum.

Again, if P. grasps the rod six inches from the weight, he exerts a force equal to four times that of F.—determined by the same law. (See Fig. 6.) Here the force exerted at weight is five times that at the fulcrum.

When we apply these rules to our post lever (which I have

Levers of the Second Kind.

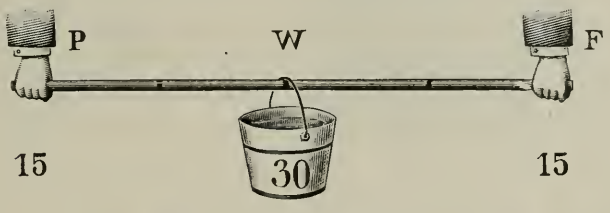

Fig. 4.

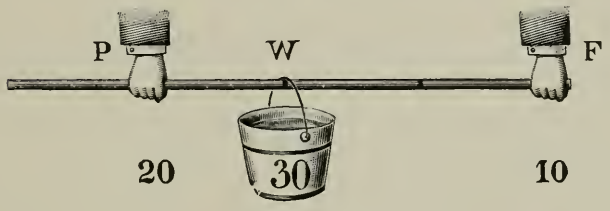

Fig. 5.

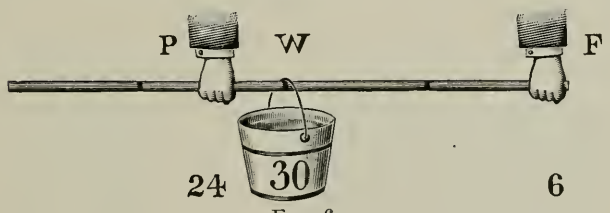

Fig. 6.

chosen to illustrate on a large scale the action of the same character of force applied to a tooth) we can see that the inverted V-shaped opening caused by the lower end of the post moving in the opposite direction from the applied power may be changed quite decidedly in area by applying the power at different points along that portion of the post above the surface. For instance, when power is applied at the top of a four foot post imbedded one-half its length in the ground, the movement at the lower end in the opposite direction will be one-half that at the surface of the ground

in the direction of the power. When power is applied one foot from the ground, or at a point one-half the length of the exposed end, the movement at the lower end will be one-third that at the surface, and when applied six inches from the ground (or as near to the alveolar margin of a tooth as the gum will permit) the movement at the lower end will be one-fifth that at the surface. While teeth differ in shape from each other and from the post lever I have described, and while their alveolar surroundings do not present a uniformity of resistance to their movement, and therefore while we cannot calculate force and motion with mathematical accuracy, still the fact that they are imbedded one-half their length in a yielding substance and subject to the frequent application of force for the correction of irregularities, the only way by which we can approach an exact science in the application of power for their movement is to consider them as levers propelled by a machine doing work on the tissues in which they are imbedded.

When power is applied at one point to the crown of a tooth at right angles to its long axis, it becomes a lever with combined qualities of the first and second kinds. It is one more than the other in proportion to the relative difference in the resistance between cervical and apical portions. And while the relative proportion of movement at these points will be governed largely by the stability of their bony surroundings, it may be influenced considerably—as with the post lever—by the position upon the crown at which power is applied. For instance, in the construction of an appliance for the retrusion or retraction of the incisors with a traction wire extending from molar anchorages, if we wish the least movement possible of the roots in the opposite direction, the wire should rest upon the incisors as near to the gingival margins as the gums will permit. I usually solder to the bands upright bars which extend to the highest points of the exposed faces of the crowns. Grooves or rests are cut at the upper ends of these for the wire, enabling it to span the interproximate gingivæ. (See Figs. 7–8.) I frequently extend these bars above the gum margins, as shown in Figs. 9–10, in order to apply power that is equivalent to direct force upon the roots at points above the margins of the alveoli, and I find these procedures of the greatest importance in arriving at results for which they are designed.

It is not necessary for me at this time to multiply descriptions

of methods relative to other teeth and conditions where this important principle may be employed, further than to say, that whenever it is desired to avoid producing an abnormal inclination of the crowns of teeth in the direction of the applied power, it is important and nearly always possible to take advantage of this or

Fig. 7.

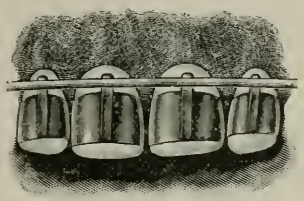

Fig. 8.

some other equally effective mechanical principle. On the other hand, whenever in the movement of a crown under the application of a single force it is desired to move the root in the opposite direction, the force should be applied as near as possible to the occluding border. This is especially applicable in those very common cases of protruded crowns of the superior incisors, with a retrusion of the roots; the teeth often assuming a decided labial inclination with the production of a depression along the superior portion of the upper lip.

Fig. 9.

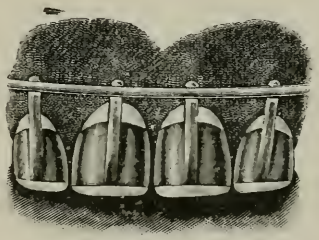

Fig. 10.

A tooth becomes a lever of the third kind when the power is applied at or near the cervix with the establishment of a mechanical fulcrum near the occlusal portion of crown, forcing work or movement of the entire root in the direction of the applied power. (See Fig. 13.) This is one of the most

important and practical principles in dental and facial orthopedia and one, moreover, to which I am indebted for nearly everything I have accomplished in the development of æsthetic facial contours. Instances where this principle may be used to advantage are almost limitless, either in the form of two forces exerting a regulated power in opposite directions for the purpose of tipping the root in its socket, or as power restrained by an independent fulcrum with the view of moving the entire root in one direction.

In a paper presented at the Tri-State dental meeting at Detroit, in 1895, I gave the following explanation :

"The limited area upon which force can be applied to a tooth compared to that portion covered by the gum and imbedded in a bony socket, has made it next to impossible with all ordinary methods, to move the apex of the root in the direction of the applied power; nor could this ever be accomplished with force

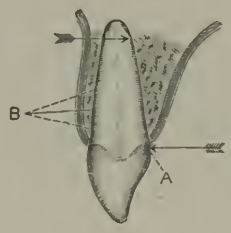

Fig. 11.

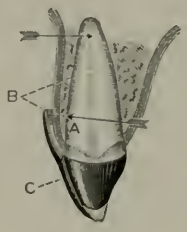

Fig. 12.

exerted in the usual way at one point upon the crown, however near the margin of the gums it be applied, for the opposing margin of the alveolar socket must receive the magnitude of this direct force, and in proportion to its resistance it will become a fulcrum exerting a tendency to move the apex of the root in the opposite direction."

But if in the construction of the apparatus a static fulcrum is created independent of the alveolus at a point near the occluding portion of the crown while the power is applied at a point as far upon the root as the mechanical and other opportunities of the case will permit, the apparatus becomes a lever of the third kind, the power being directed to a movement of the entire root in the direction of the applied force.

This proposition is made plain by reference to the diagrams. In Fig. 11 let A be a point upon a central incisor at which force is

applied in the direction indicated by the arrow, then will the opposing wall B of the alveolar socket near its margin receive nearly all of the direct force; and in proportion to its resistance will there be a tendency to move the root in the opposite direction. This proposition will also hold good even if we apply the force at A, Fig. 12, or as far upon the root as may be permitted by attaching a rigid upright bar—C—to the anterior surface of the crown, the only difference being that we distribute the direct force over a greater area. But if, as in Fig. 13, we attach to the lower end of C a traction wire or bar F, and further enforce the mechanical principles of our machine by uniting its posterior attachment to the anchorage of the power bar P, we will have neutralized our anchorage force materially and created an independent static fulcrum at D. Our apparatus now will distribute its force over the

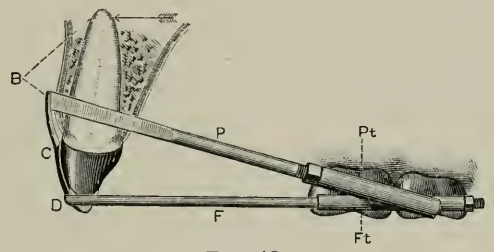

Fig. 13.

entire root and give us complete direction and control of whatever power we put into it. The entire tooth can be carried forward bodily or either end can be made to move the more rapidly. The force thus directed to the ends of the roots will have an increased tendency to move the more or less yielding and cartilaginous bone in which they are imbedded.

An apparatus for moving the roots of the anterior teeth in a posterior direction is constructed quite similarly—the direction of the two forces being reversed.

In that branch of my teaching entitled "Construction of Regulating Appliances and Their Management," I endeavor to arrange the work systematically according to the distinct mechanical principles involved in the scientific application of the required force. I divide the whole subject under this head into two general divisions entitled respectively, action and reaction. Under the head of "action," which pertains exclusively to the movement of mal-

posed teeth by the direct action of force, I take up: First, the movement of crowns in every direction. Second, the movement of roots in every direction, with or without the movement of their crowns. Third, rotating or turning of teeth on their long axes. Fourth, intrusion and extrusion or the gradual forcing of teeth in or out of their sockets.

The second main division of the work entitled reaction, pertains to the management of the opposing force to action. This I divide into: First, reciprocating or movable anchorages, describing methods for utilizing the force of reaction in the movement of other malposed teeth; and, second, stationary or static anchorage appliances. I do not mean by this that I confine the teaching of this work to a single branch at a time to the exclusion of all others, but I endeavor to blend them into each other, illustrating the principles, as I progress, with practical cases.

DISCUSSION.

Dr. GARRETT NEWKIRK: *Mr. President:*—How thankful we ought to be to any man who comes before us and gives us the crystallized product of the hours, days and years of his industrious study of a given subject. How fortunate this Society is and has been, especially during this meeting, in having that sort of an experience. Do you realize, young men of the Society, how new dentistry is? How short the time has been since orthodontia was little more than nothing, just a mass of crude experiments. There was no analysis of force, such as we have listened to to-day, but simply here and there a paper accompanied by some crude cuts, illustrating some man's experiments, with apparatus, cumbersome, awkward, ill-fitting, disagreeable to the patient and unsatisfactory in their results. It has been my fortune and misfortune to meet patients who have gone through nearly all sorts of experimentation. During my practice of fifteen or twenty years Ihave used nearly every kind of contrivance in the attempt to regulate teeth. I cannot express the obligation that I feel personally and which I think the profession ought to feel toward Dr. Case for his devotion to this branch of dentistry and the wonderful work he has accomplished in it. He is an artist. He cannot even put up a tack without demonstrating his neat way of doing things. Is there any one else who has demonstrated so fully the different forces of leverage and their various applications

of principles to the positions and the movements of the teeth? Not to my knowledge.

I was glad, first of all, that he spoke of the importance of principles rather than attention to all sorts of details in the instruction of students. What we need, and what the world generally needs in real life, in every department of human endeavor, is the understanding of principles and an adherence to them. Principles never fail. In the end they work out their legitimate results, and the man who adopts a principle, moral or social, of honesty or absolute truthfulness, who stands by it through thick and thin, against all obstacles, against all apparent indications of policy, without selfishness or subterfuge, he is the man who in the end is going to succeed in life and be respected by his fellows. It is the same in professional matters. We must depend upon principles and in the end they will bear us out. I will say in this connection what Dr. Case has not had time to say, but probably what he would say if he was speaking to the subject, that whenever we have a case presented to us for consideration, the first thing to do is to study carefully the facial expression, the effects which have been produced by the positions of the teeth, and the development of the alveolar process. We shall be materially assisted in this when we have the benefit of Dr. Case's book, which is to be published one of these days, wherein he has laid down rules and has given us illustrations, so that we may understand far better than we can now without present means of study the laws which govern these conditions. We shall know better then just what the effects are of the positions of the teeth upon facial expression and what corrections are necessary in order to produce the best and most harmonious results. We had from Dr. Case not long since, at a meeting of the Chicago Odontographic Society, a paper on this subject, so that I know what is in store for us in the future. I think we may esteem it an honor and a piece of good fortune that Michigan not long ago surrendered the author to us so that this work will come from an Illinois man.

Having studied the facial expression, the practitioner should take impressions and make accurate models. He should not be afraid of making too many, so that in case one should get broken he has another to fall back upon. I have had casts sent to me by dentists from various parts of the country; sometimes a partial

cast, representing only six or seven teeth, and I am asked what I would do in such a case. No one can tell anything about the case so presented. Always make one, if not two, accurately articulating models to begin with, so that yourself or whoever is consulted may have the whole relation of the two sets of teeth and the jaws to consider. What may seem to be indicated by a partial cast may be entirely contraindicated by studying the whole case. If you have in view the correction of a case of irregularity yourself, do not be in any hurry; study the models carefully; lay them down and pick them up from time to time, and very likely the third or fourth time in looking at them you will discover something new and possibly very important. Do not be in a hurry about making up your mind as to what shall be done. Make models from time to time as well as measurements showing the progress of the case. Your original models are always invaluable in that they are absolute evidence as to the original condition and showing also what you have accomplished.

Dr. G. D. Sitherwood, Bloomington: I wish first to thank Dr. Case for his paper. There has not been a paper presented here in which I am more interested than in this. Some two years since I asked Dr. Case the question, if the time would ever come when the busy practitioner could make and use these appliances in orthodontia, with the same facility that he makes bridge work, or fills teeth. After listening to this paper my hope is renewed, and I believe we have nearly arrived at that time. The principles that he has given us are interesting and instructive. I had the pleasure of listening to a similar paper before the Iowa State Dental Society last week, in which the essayist took the ground that it was frequently best to use very thin German silver bands, because many times the spaces were so small between the teeth. The surprising thing is the strength of the thin bands of German silver that are now furnished.

I also notice that Dr. Case rather discourages us in using the bands already prepared for the molar teeth. While I admit that it is frequently better to make our own bands to fit the teeth, yet I do not think the busy practitioner ought to be discouraged if he can purchase an apparatus already made that will fit and do the work because of the time that it takes to make many of these appliances.

The principle he has given us in banding two teeth is very

useful. We all know the danger of moving a molar tooth or getting anchorage; static anchorage, as he designates it, is useful indeed. But these appliances that are now made and the teachings that the young men are receiving in our dental colleges are very encouraging, and we older members who have been plodding along in this old way will have to look after these things, or we will be outstripped by the young men. As has been stated, this matter is being taken up and is so well taught at the present time, that the time is at hand when the busy practitioner can regulate teeth, and orthodontia will be as much a part of his business as bridge work and plate work. I am encouraged in the belief that this is so. There was a time when this could not be done with the appliances that we formerly had. We are all instructed by the teachings of men like Dr. Case. Do not let us theorize about these things, but let us go home and go to work and remember the principles he has given us. If we cannot regulate the case in hand, then we should send the patient to Dr. Case.

Dr. Arthur G. Smith, Peoria: I do not intend to discuss the paper of Dr. Case. I wish simply to say that I received a course in orthodontia when I went through college, and thought I knew something about it. I see now that I do not. I have learned more about orthodontia this afternoon and the fundamental principles underlying it than ever before, and I may say that I have studied carefully everything that Farrar has written on the subject and am familiar with the writings of every other man of prominence on this subject, but the words of Dr. Case have impressed me so deeply that I hardly have sufficient self-control to speak of the tremendous field that is open to us in this matter.

Dr. G. M. Brunson, Joliet: I do not wish to discuss the subject, because it has already been very ably handled by the other speakers. But I would like to have Dr. Case explain Fig. 11, and ask him if he considers it safe to move the apex of this root so far without endangering the life of the pulp, even if moved very slowly.

Dr. W. T. Magill, Rock Island: Dr. Case has kindly told us the material he uses in this work, namely, thin bands of German silver. The great difficulty I have had is in using a wire which, after it was drawn up or pulled back, would not stand any length of time till the thread in the nut cuts out, particularly

when made of German silver or nickel. When used in this way, I have been unable to find a metal that would stand everyday practice, and if there is such I would like to know it.

Dr. G. D. Sitherwood: I would like to ask Dr. Case to tell us, when he closes the discussion, something about regulating teeth. For instance, a great many gentlemen in regulating teeth have looked at the superior teeth, paying no attention to regulating the inferior, or paying no attention to the superior, which is quite an important thing in orthodontia, particularly in the occlusion and the articulation of the teeth. Many gentlemen have become discouraged in regulating teeth because they only gave attention to the superior teeth, particularly with reference to occlusion or articulation of the teeth. I would like him to say something on this point.

Dr. J. G. Reid: It is very amusing to me when I hear discussions on papers once in a while, and especially on this particular paper. It appears to me a sinful thing for members to get up and mar by our discussions a paper that in itself requires no discussion. Dr. Case has brought before us one principle that is of practical value to dentists. It is a principle of force, and he has brought nothing here to teach you how to regulate the number of teeth that come before you for regulation. Every case that presents itself to you is different. Dr. Case has simply told you in a simple way the force that is used and how to use it. Poets were born, they were not made; and some of you may think that you can go home and regulate teeth, after you have heard what Dr. Case has said. Of course, you will do your best, but this work requires much study. Dr. Case has been studying it for twenty years, and some of you will expect to do in one month what another man has been studying diligently for the last twenty or twenty-five years in order to attain the objects desired. He has given you the basic principles of orthodontia, which simply consist in force and how to apply it.

Dr. Edmund Noyes: I wish to differ a little with Dr. Reid in the manner of expression rather than in real sentiment. It is fortunately the case that a man who has studied over a thing for a long time, and knows it, may be able to tell it to somebody else in fifteen minutes, so that he may know it, although the author may have spent ten or fifteen years hard study to find it out. This is one of the blessings of genius and of the possibilities of the progress of

knowledge in this world, and we should bestow unmeasured gratitude on the man who has spent a lifetime, so to speak, in developing this work and then gives us the fruit of his labors. If that were not the case the world would not make any progress. A man may spend a lifetime in determining the atomic weight of oxygen, and if we did not know it by what he tells us in an hour and a half, if we had to go to work and learn the thing the way he did, the world would not make any progress in scientific knowledge.

We have had an exposition of the longitudinal axis of a tooth in its relation to the alveolus and the description of the manner in which force may be put upon it by levers is invaluable to us as the basis of our thought and work in orthodontia. Perhaps this principle of force is a thing which has taken Dr. Case a long time to develop or to get a clear idea of it in his mind, but now we can see it clearly and very quickly. He gives us in a few moments the reasons for exerting force away up above the alveolar border, or away down at the occlusal end of the tooth, depending upon whether we want to move the root most or the occlusal end most. Furthermore, he gives us appliances which enable us to fix the apex of the root or the occlusal end and move the other end.

There is just one suggestion that I want to make with reference to a text-book on this subject, and that is, that every minutest detail of the construction should be given carefully. I have often heard it said by persons who have listened to lecturers in colleges and to papers in societies, that when they went home and began to make something they ran immediately against some detail which they did not know just how to handle. They did not know just how thick to make the band, or how large a tube to use, or just what thickness of German silver to roll into the tube, and a number of other minute mechanical details that the man who is speaking has experimented with over and over, and which he failed to give in his remarks.

Dr. A. H. Peck: I shall not attempt to discuss either the paper or the subject; I do not know enough about it to do that intelligently. But I rise most cheerfully to express my true, genuine admiration of Dr. Case in connection with this work. Connected with nearly every department of our profession are more than one man of ability and reputation; but in my judgment, when it comes to the regulation of teeth, to the construction of mechanical appliances based upon true scientific principles, and their ap-

plication, there is only one man in this world for me. (Applause.) While he may not be so very handsome, and I admit there is room for doubt on this point, he is certainly of high degree. (Laughter.)

Dr. Case (closing the discussion): In reply to the question relative to the danger of devitalizing the pulp in moving the roots of teeth, I am pleased to say I have never happened to destroy a pulp in this way. I have destroyed pulps in the movement of teeth in other ways, but where the whole tooth has been carried bodily forward or back, no pulps have been destroyed. I do not know when it will occur. I think you would be surprised to see some of the teeth under the influence of this contouring force. Usually, in applying a contouring force to the four incisors of young people, the entire intermaxillary portion of the alveolar process, in which the incisors are embedded, seems to be forced forward or backward with the roots; but occasionally I meet cases in which the movement seems to be accomplished by absorption of the process, and in those cases the roots of the teeth often stand out so prominently that I am somewhat alarmed. When I see this condition, I let up on the force, but my experience has been that I have never destroyed the pulps.

I hardly think it advisable for me to attempt to reply to the many things which arose in the discussion. My paper was confined to one branch of orthodontia. One thing however was said, that was quite discouraging, in reference to whether dentists could learn to regulate teeth. It is my one hope, if I have any hope in the world greater than another, to establish some universal principle upon which all dentists can take up different cases and properly regulate teeth. (Applause.)

I thank the society, as I have had occasion to do before, for their very complimentary words, which were far more than I deserve.

RESULTS OF EXPERIMENTS IN BACTERIOLOGY.

By A. H. Peck, M. D., D. D. S., Chicago.

These experiments occupied so much time we were compelled to forego the use of many agents until some future date.

Because of many questions that have been asked by various members of the society regarding this work, I will make seemingly necessary explanations as we proceed.

As I stated yesterday these experiments were conducted in the following manner: Tubes, containing on an average eight c. c. of sterilized broth were used. The broth was infected with the saliva of various members of the class. In connection with each set of plants a control tube was used, which latter invariably presented unlimited growth.

The observations from which these results were compiled, were carried on through a period of three days.

The tube containing one drop of oil of cassia, presented no growth.

Oil of cinnamon one drop, no growth.

Dr. Black's 1, 2, 3, one drop, no growth.

You heard more or less said yesterday afternoon regarding the use or nonuse of oil of cassia and the reasons that were presented. I have been asked by many about the use of 1, 2, 3, which is composed, as you well know, of cassia, carbolic acid and gaultheria. Whether or not it is irritating to the soft tissues as is cassia, I will simply state that I have experienced no such trouble, and Dr. Black is inclined to think that when the three ingredients are properly mixed, there is more or less of a chemical union between them, so that the individuality of each separate agent is lost to a greater or less extent.

Oil of cloves one drop, no growth. I will state that in connection with this agent I was much surprised to find no growth in the tube containing one drop, and several subsequent plants were made that the result of the first might be verified, which was invariably the case. Since oil of cloves has proven to be such a potent

antiseptic, and also because of its soothing, quieting effect on irritated, soft tissues, it has become a favorite agent in my practice.

Beech-wood creosote, one drop, no growth.

Myrtol, two drops were required to prevent growth.

Cajuput, five drops, no growth.

Eucalyptus, (Sander's), six drops, no growth.

Eucalyptus, (Merck's), seven drops, no growth.

Carbolic acid, 95 per cent, three drops, as I stated yesterday, restrained the growth for three days, after which time the bacteria developed abundantly.

Gaultheria, five drops, growth. I will say here, that when growth is reported as following the use of an agent that said agent was used up to a quantity that formed a saturated solution in the broth, thus rendering it useless to experiment with larger quantities.

Terebene, five drops, growth.

Eugenol, eight drops, growth. One of my greatest surprises occurred in connection with the results of eugenol. I had been in the habit of using it a great deal and had considered it quite an effective antiseptic, but finally had to give it up as absolutely worthless as such.

Bichloride of mercury, one to one-thousand solution, six drops restrained the growth, i. e., the bacteria developed to a certain extent.

Hydrogen peroxide, (3 per cent), four drops, no growth.

Peroxide of hydrogen, (Marchand's), three drops, restraint; five drops, no growth.

Pyrozone, (3 per cent), four drops, restraint; five drops, no growth.

Borolyptol, ten drops, no growth.

Euthymol, ten drops, growth.

Listerine, ten drops, growth.

Formaline, (10 per cent) five drops, no growth.

Resorcin, (15 per cent), six drops, no growth.

Lysol, (10 per cent), ten drops, no growth.

Iodoform, saturated solution in the broth, the bacteria developed as if nothing had been present.

Nosophen, saturated solution in the broth, result same as iodoform.

REPORT OF THE COMMITTEE ON DENTAL SCIENCE AND LITERATURE.

By A. W. Harlan, A. M., M. D., D. D. S., Chairman, Chicago, Ill.

Following the custom of former reports presented from year to year on the advances made during the time since the last annual meeting, your committee begs to submit the following: The most noticeable work in science is that contributed by Dr. J. L. Williams, of London, England, on the incipiency of caries of the enamel. The report of this most industrious worker with the microscope has been published in the *Dental Cosmos* and is still running as a serial in that magazine. From what has already appeared and that which is to follow constitutes the results of years of hard, continuous labor. It is the most admirable undertaking that has appeared in the decade since Miller's studies on the etiology of caries. Dr. Black's recent paper on "Recent Improvements in Filling Teeth," Dental Review for February, 1897, is commended to your attention as well worthy of study and of being put to practical use at once by all. Hugenschmidt, of Paris, has presented a notable paper on the protection of the oral cavity against the inroads of pathogenic bacteria, *Dental Cosmos*, 1896. Bethel presented a paper before the American Dental Association on "Lining Root Canals with Nitrate of Silver," which is something entirely new. Wilhelm Loche has contributed a paper on the "Earliest Development of the Molars in Man,"* which is well worth careful reading. Walker, of Pass Christian, Miss., read a paper on the Glenoid Fossa, which has attracted much attention.

A recent paper on the discoloration of teeth with copper amalgam, by K. W. Goadby, shows much careful research (*British Journal of Dental Science*). The X ray has received more attention than was at first thought possible. Catching, Rollins and Kells seem to have been most active of the dental surgeons who have published accounts of their work. Cataphoresis has received much care and attention during the year, more in the nature of its

*See Catching's Compendium.

application and the perfection of instruments for the successful use of this method of preventing pain for the extraction of teeth and the obtunding of sensibility of dentine. In this connection it may be well to utter a word of caution, as it appears that pulps may be destroyed by its use and other soft tissues injured by its careless handling. We still believe that it has come to stay as an aid in the preparation of cavities in teeth. Several contributions have appeared on dental anatomical subjects, notably by Barrett and Fillebrown throwing new light on old subjects. Writers have been searching available crania for abnormalities with, so far, few results as the variations were not any greater in former times than at present found by workers in this field.

LITERATURE.

During the year several new journals have been started in the interests of alumni associations, of colleges, and two or three as organs of societies; other than these we have not found any strictly general dental journals that appeal to the whole profession for support. All such efforts are in the interests of the dissemination of sound practical matter, which will have a tendency to elevate the mass of the profession. The new books and new editions of books are not so numerous as in some former years. The most notable in the line of surgery is that of Roswell Park, assisted by a long list of collaborators, entitled, An American Text-book of Surgery.

A new edition of Mitchell's Dental Chemistry is well worthy of careful perusal. Evans' Crown and Bridge Work, is the best of its kind in any language. The American Text-book of Prosthetic Dentistry, by C. J. Essig, assisted by a number of our best writers, is said to be unusually well adapted for the use of teachers and practitioners; in fact a teacher said to me that he considered it superior to all others in that line. Hodgen's Dental Metallurgy we can recommend as filling a place which had not previously been filled. Burchard's Dental Pathology and Therapeutics, is a concise work, more valuable for students than teachers. Turnbull's Anæsthesia is one of our best manuals and it is brought down to date. Barrett's dental surgery for students of medicine is a new edition. There is not much that is new in bacteriology, anatomy or physiology. Kirke's handbook being however the best in that line.

Catching's Compendium for 1896, keeps up its reputation for variety and choice selection of the best matter appearing during the year. Every one ought to have a copy even if he is a subscriber to a dental journal, to encourage the editor.

Magyar Fogászati Szemle (*Hungarian Dental Review*). Monthly, published at Budapest, Hungary; commenced July, 1896.

La Union Dental (*The Dental Union*). Spanish, monthly, published at Valencia, Venezuela, commenced November, 1895.

Correo International Odontológica y Clinica Dental. Spanish. Published monthly at Madrid, Spain, commenced July, 1895.

The conclusion which has been reached by this committee is that new life and vigor has been infused into our current magazine literature through the continued influences of dental legislation and the organization of the faculties of colleges. Had it not been for the aggressiveness of these two forces we would not have witnessed the recent rapid growth of the widespread activities that we are enjoying to-day. The inevitable conclusion is that we are now in a prime way to begin a substantial growth, make history that will be enduring and be a part of the aggregated forces that move the world.

DISCUSSION.

Dr. Geo. H. Cushing, Chicago: This is a paper which gives us no opportunity to discuss, as I understand it, unless some member takes issue with the recommendation of the writer as to the value of the books that have been named; but I want to say one word in vindication of the wisdom of the appointment of this committee. Dr. Harlan has given us in five minutes the best that has been done in the line of literature during the year, enabling us to select those works which have been of value, and the report is made by a man who reads everything. It would be impossible for us to gain the information that we have had here in five minutes in this admirable, concise form, unless we devote ourselves to the reading of the literature that is published.

REPORT OF THE COMMITTEE ON DENTAL ART AND INVENTION.

By J. E. Keefe, D. D. S., Chicago, Ill.

Your committee on dental art and invention wishes to submit the following appliances of interest to the profession:

1. Dr. J. T. Baker's Case Heater and Soldering Furnace.—This device consists of a revolving iron cup with fireproof lining, and filled with pieces of broken pumice in which to pack the investment. A forced blast of gas enters at the bottom, the pressure being governed by the gas and air valves, thereby securing a more intense and evenly distributed heat beneath and around the sides of the investment; thus there is no checking of the porcelain or warping of the bridge or plate.

2. An Improved Electric Oven, by Dr. L. E. Custer.—The improvement consists of a new system of wiring, whereby the wire cannot burn out in the practical use of the oven for firing porcelain. The wires are all exposed to view and full heat is immediately realized. It is also made in a larger size for extra large cases.

3. Dr. F. W. Blomily's Mouth Mirror Holder.—With this appliance the operator is enabled to adjust and secure the mirror in any position desired, easily and quickly, and it will be held there as securely and steadily as if held by an assistant.

The apparatus is attached to the head of the patient in a manner that is perfectly comfortable and secure and is no more in the way of the operator than the ordinary mouth mirror. Being attached to the head it is always in position independent of the movements of the patient's head. It can be used as a mirror or as a reflector to throw light down into deep cavities. It is practicable and universally applicable and will enable an operator to do his work better and more easily than without.

4. The Sawhill Universal Separator, sent by Dr. Blomily.—This separator has but one cross brace and arm and those being connected to revolving points or wedges permit the brace being

turned to either side out of the way while it is in use, without removing until the operation is completed.

It is perfectly universal, being applied to the molars as easily as to the anterior teeth.

5. Improved Clasps for Dental Plate, by Dr. W. S. Elliott.—This clasp is composed of a platinum gold wire, gauge 20-22, bent upon itself to form a band or loop. This doubled wire is manipulated the same as a flat band and is made to embrace the natural tooth as required, the free ends of which may be imbedded in a rubber plate or soldered to a metallic one. The advantages claimed are:

a. Ease of construction and adaptation, no anchor piece or stay being necessary to secure it to the plate.

b. Perfect cleanliness. It will not retain the secretions of the mouth, consequently there will be no fermentation.

c. Smoothness; no angles or sharp edges to irritate the tongue or tissues.

d. Great strength.

e. Capability of more delicate adjustment after being placed in the mouth.

f. It is less conspicuous than a band.

g. It is less costly than a solid band.

6. Soldering Pliers, by Dr. W. S. Elliott.—These pliers are made with ball and socket joints so that they can be adjusted and set at any angle, and have clasps on each end to hold in any position a plate or bridge while soldering. Dr. Elliott also sends a rubber dam holder which is not new, but has never, he claims, been presented to the profession.

7. Dental Abscess Syringe, by Dr. Middaugh.—The object of this syringe is to force medicine through the apex of the root into diseased tissue and out through the fistulous opening, if there be one, thereby flushing the diseased tract. It is made in five sections, consisting of a platinum needle, a metal bulb, a valve, a rubber tube and a large rubber bulb, all being detachable. The advantage claimed for this syringe over others is that a great force can be produced insuring the flow of medicine used through the root treated, no matter how small the opening.

8 and 9. Two Matrix Retainers, by Dr. J. M. Strout.—*a.* The universal matrix carrier is so constructed that it can be attached to any sized tooth without change of matrix. It is made to carry the

thin steel ribbon band matrix. By turning cap at end of barrel, you cause matrix to close around and hug, until it conforms to shape of tooth. It is not necessary to have a different matrix for different teeth; one does for all.

b. This has a hook or traveling arm, and is operated by a bur at end of barrel. This retainer can be used upon the buccal, labial, lingual and palatine surface of the teeth, and can be adjusted to fit any tooth.

10. A Steel Punch, by Dr. G. A. Widotte.—The object of this punch is to cut pieces in metal plates and bands so that they will project, thereby enabling one to attach clasps to a plate by vulcanizing in place instead of soldering them.

11. An improved Mallet, by Dr. Widotte, with a removable handle and leather head.

12. A set of four root Scalers, designed by Dr. J. E. Keefe.—The advantages claimed for them over others on the market are the edges are rounded, thereby causing less pain. Also an improvement on Mandrel, by Dr. J. E. Keefe, that was presented to the Society two years ago, consisting of retainer for pin which prevents it from falling out at the shank.

13. An improved Syringe, by Dr. J. W. Wassell, for applying remedies to pyorrhœa pockets.—They are inexpensive, so that a large number may be kept in use, allowing a separate one to be used for different medicaments in each case under treatment. A special form is made for injecting pockets of upper teeth and a special form for lower. Just back of the fine platinum tube which forms the nozzle and which is fused into a glass tube is a bulbous enlargement made by the glass blower. This acts as a reservoir for the fluid used and prevents its passage backward into the rubber bulb.

14. Electric Mallet, by Drs. Barnes and Skinner.—This mallet is so constructed that it requires a very small current to operate it. The two poles allow the armature to get within 1-100 of an inch. This result is obtained by a specially constructed magnet.

The Electric Armature is a dental hammer of sufficient size to absorb all magnetism. It is held at the proper distance by a spring, but has no friction to overcome, being guided only by the tool holder through the center. It can be used from direct, alternating or battery currents.

15. Scaler, by Dr. G. H. Winkler.—This scaler differs from

others now in use, in having a perforation just at the cutting blade to prevent the clogging of the blade, thus allowing the deposit in its removal to pass through the opening in the instrument.

16. Lowry's system of crown and bridge work consists of a series of dies formed from natural teeth ranging in size from the smallest to the largest teeth found in the mouth. It includes dies for contouring the bands, which feature is something entirely new and effectual. The dies are of uniform size and are used in a stamper, consisting of a metallic base and a steel plunger which slides vertically in a sleeve supported from the side by an arm in which is concealed a small spiral spring which holds the plunger in a raised position during the placing of the die, the gold plate and bullet in position, as well as to prevent rebounding of cap and die under percussion. The dies are in pairs of rights and lefts, taken from the same mouth and are absolutely indestructible.

The trial caps are numbered to correspond with the number of the die from which it was made, so there is no difficulty in finding the die wanted, after a suitable cap has been selected. Included in the system is a pair of pliers for holding the band and cap in position while soldering. They have one curved point which rests with pivotal pressure at the center of the cap, preventing tilting of the cap and allowing the heat to diffuse equally on all sides of the crown and preventing the solder from flowing unevenly. The advantages of this system over all others consist in a great saving of time and annoyance, and in the perfection of the work produced.

17. Dr. Taggart presents a new process for holding the rubber dam below the edge of the cavity in difficult cervical cases.

The process consists of driving small steel wedges into the cementum of the tooth.

In using the wedges, they are fitted into a hole in the end of a straight or curved instrument which screws into the automatic plugger in the same way that a plugger point does, or in other words, the steel wedge forms the point of the instrument, and is easily handled in this way. In order to hold the minute edge securely in place and prevent it from dropping off, the instrument is magnetized.

This process is particularly suited to very bad cases, as the

distance of the cavity from the gum makes no difference in the application of the dam or wedges.

18. The Mason Ceiling Bracket.—An extension arm from ceiling for support of engine head; a device to take the place of a suspension engine or wall bracket. It has a universal joint, and is so constructed as to hold the engine head in any position required without interfering with instrument bracket or occupying any space needed for cabinet, instrument bracket or cataphoric appliances. It takes no floor space, and is always up out of the way. The joint spoken of is so constructed that a pair of pulleys attached to same for carrying engine belt is always in line for the belt, no matter in what position you may place the engine head; making it certain that the belt will not run off when adjusting the engine to suit position desired by operator.

Any engine head can be used, thus making it available for cord engine as well as any other that a dentist may have on his foot engine.

The universal joint is so made with set screws as to provide for taking up the wear, having a steel disk between each joint to insure least wear and greatest durability. The head of the engine is set loose into bracket arm so as to give swivel movement, and the extension part of arm is governed by chuck device to lock the extension at any point. By this operation the stretch of belt can be taken up in a moment. A support for hand piece, when at rest, is attached to arm or engine head according to style of head used. The engine is intended to be run by some kind of motor.

19. Improvements demonstrated by Dr. J. W. Dennis, of Cincinnati, Ohio. Amalgam Sweaters or Pluggers.—These consist of interchangeable points of a variety of forms adapted to the variously situated and forms of cavities daily presented for repair.

At the "business end" of a cone socket shank is a disk termination, say an eighth of an inch in diameter bent to a quarter angle at the neck and armed at right angle to face of disk with a square steel spud.

On this spud the sweater, which is composed of a combination of hard and semi-hard rubber, is mounted. It is composed of two kinds of rubber in about equal proportions, the whole composing a piece, assuming various forms, about the size of a "navy bean."

These are formed and vulcanized in metal moulds, one end being hard to be perforated with a taper reamer to receive the spud on which it is simply pressed and retained during use, while the end will yield to pressure and when applied to a recently made amalgam filling no matter how dry the amalgam has been worked, will continue to draw the mercury to the surface until it has been repeatedly treated with the absorbent pads hereafter to be described.

20. Pads for Absorption of Mercury Excess Brought to the Surface of Amalgam Filling by Sweaters, by Dr. J. W. Dennis.—These are disks, cylinders and blocks in great variety of forms and sizes composed of rubber in which tin has been largely incorporated. The combination is then subjected to the vulcanizing process; this, however, is arrested at a point which leaves the mass so that it will slightly yield to strong pressure. From a block of this the various forms of pads are cut.

For convenient use they are mounted on an instrument similar to the one before described, with this difference, that upon the before described head or disk of the cone socket shank is mounted a rotating disk armed with three or four needle points. Into a pad, cylinder or block suitable for the case in hand, these needle points are thrust, thus holding the absorbent piece in position for application to the already sweated filling from which the tin, as the pad is pressed firmly for a moment, absorbs the excess of mercury. As this part of the process goes on, the block or cylinder as it becomes charged with the mercury is rotated to suit the various irregularities, angles and margins of the filling is then removed and turned so that a fresh or uncharged surface is now represented to and pressed upon the again sweated surface of the filling.

21. The Use of Copper for Preserving Decaying Teeth Without the Objectionable Features of Copper Amalgam. By J. W. Dennis.—With a saturated solution of chloride of gold a given cavity is carefully wiped by the use of cotton wrapped on a fine broach—in deep-seated caries or very soft teeth. The nearest points of nerve exposure should either be capped or well varnished—being careful to thoroughly saturate those points where recurrent decay is most likely to appear.

Now, with a blower especially constructed, copper bronze is quickly blown into the cavity while it is yet moist. Should it be

desirable to obtain instantaneous oxidation at any given point or in the entire cavity, another application of the chloride is made to the copperized surface and another coat of powder is blown on the moist surface.

Thus the cavity is lined with an oxide which, while it differs chemically from that obtained by the old-time combination of tin and gold, and recommended by such men as Palmer, especially at cervical borders or the oxidation of copper amalgam is certainly more effective because instantaneous and penetrating. By the old methods these results, always valuable, could only be reached by months or years of waiting for oxidation to take place. The treatment here described may be repeated two or three times with advantage in some cases which of course is a matter of judgment with the operator. After each application, however, the cavity should be thoroughly dried with the warm air blower.

It is possible this method may prove very valuable in a large class of cases now known as irrepressible decay, especially in the young, where methods now in vogue utterly fail.

22. Adjustable Tooth Brush, by Dr. J. W. Dennis.—This implement is so constructed as to reach the labial and lingual surfaces and irregularities and interstices of the natural teeth more thoroughly than can a straight brush, and enabling the user to employ the perpendicular movement in cleansing the teeth so necessary to the preservation of the natural and healthy gum line. It is also capable of reaching and cleansing the recesses and pockets created by the insertion of bridge work.

23. Matrices and Wedges, by Dr. J. W. Dennis.—These consist of sections suitably formed out of ribbon steel upon the border or borders of which a lip is formed so that when the wedge, which is made of copper, dressed to a sharp edge on one side, being thicker at the opposite to represent the greater space at the gum line—is driven or pushed between the opposing tooth and the one to which the matrix is applied, the matrix will be held steadily and uniformly in position as desired and the wedge will be kept from infringing on, bruising or lacerating the gums.

REPORT OF THE SUPERVISOR OF CLINICS.

By Dr. T. W. Pritchett, White Hall, Ill.

BY DR. E. K. BLAIR, WAVERLY.

Clinic No. 1. Patient, Mr. Vadder. Gold filling in occlusal cavity of left lower cuspid. The incisal edge of tooth was restored. Rowan's pellets being used for body of filling, the operation being finished with William's No. 6. The work was thorough from start to finish.

BY DR. THOMAS L. GILMER, CHICAGO.

No. 2. Patient, Dr. J. F. Wallace, Canton Mo. Gold filling in mesio-occlusal cavity of upper right second bicuspid. Preparation of the cavity was excellent, with the exception of the linguo-gingival angle, which, in the judgment of your committee should have been extended or squared a little more than it was. Dr. Black's margin trimmers were used in the preparation of the margins. Rowan's pellets were used throughout the filling. Probably a better or harder surface would have been obtained by finishing with heavy gold. Contour of filling was good.

BY DR. C. C. CORBETT, EDWARDSVILLE.

No. 3. Patient, Dr. A. L. Nicholson, of El Reno, Oklahoma. Gold filling in distal cavity of upper right central incisor. Sensitiveness of dentine was obtunded with cataphoresis—results being fairly satisfactory. In our judgment the linguo-cervical angle should have been extended a little farther.

Oxyphosphate cement was used to anchor the gold, thus preventing the extravagant cutting of tooth substance—starting one-third of cavity first and finishing with a large pellet of gold. It was claimed that the cement will also prevent future discoloration along the margin of the filling.

BY DR. R. N. LAWRANCE, LINCOLN.

No. 4. Patient, Mr. J. A. Hamson. Pyorrhœa alveolaris. The main point in the work was the instrumentation in removal of deposits—Dr. Younger's forms of instruments being used. Sulpho-

naphthol was used as antiseptic agent in preference to any other because it was claimed it does not stain the instruments and has a decided sedative action on the soft parts. Lactic acid was also used as a stimulant to the tissues. The work was thoroughly done.

BY DR. J. W. COLLINS, LINCOLN.

No. 5. Patient, Mr. Fred. Hudson. Gold filling in occluso-distal cavity in right upper central incisor. Tooth pulpless. Root filled with gutta-percha.

The cavity was filled with Williams' gold and platinum, shade 2, thickness 30.

Condensation was made with the electric mallet, and the finished effect was good.

BY DR. W. H. TAGGART, CHICAGO.

No. 6. Patient, Dr. Butler, La Harpe. Application of rubber dam to cervico-labial cavity in right lower first bicuspid by means of steel points, one or more, driven into the cementum of the tooth. This method obviates the use of the clamp when the cavity extends deeply under the gum margin. The application of the dam in this case gave but little pain to the patient, and gave excellent opportunity to operate upon the cavity.

BY DR. GUSTAVUS NORTH, SPRINGVILLE, IOWA.

No. 7. Demonstrated with charts and models, a method of constructing partial lower vulcanite dentures. The advantage claimed was that it prevented the plate from rocking or slipping from place during mastication, and could be worn with comfort by the patient.

This was accomplished by simply carrying or extending the pink rubber forward in the shape of a clasp to grasp the buccal or labial surface of the mesial remaining natural tooth of both sides of the jaw, the pink rubber extending down some distance upon the gum of the clasped tooth.

BY DR. H. S. LOWRY, KANSAS CITY, MO.

No. 8. An exhibit and explanation of improved dies for swaging cusps for crown and bridge work. Also dies for swaging to form the buccal or labial portion of bands for metal crowns. An anvil with plunger attachment to direct the force in stamping and pliers for holding crown during soldering. The whole set is a great improvement over this class of instruments and commends itself at a glance.

BY DR. J. W. DENNIS, CINCINNATI, OHIO.

No. 9. Applying powdered copper to interior walls of cavities, blowing same from chip syringe, the cavity previously being coated with nitro-muriatic acid. Advantages claimed, first, the arresting of decay; second, overcoming the discolored enamel margins so common when copper amalgam is used.

BY DR. J. E. HINKINS, CHICAGO.

No. 10. Building down lateral incisior corner with platinum and gold—filling first third with Fellowship gold, and finished with Williams platinum and gold foil Nos. 60 and 120, shade 2.

Time of filling, one hour and fifteen minutes. One of the features of this operation was the small number of instruments used. The cavity was prepared with two chisels, two diamond pointed scalers and three burs. The filling was inserted with two flat-surfaced round pluggers with deep serrations, and two foot pluggers of medium serrations for the platinum foil.

Cataphoresis was used to obtund the dentine, the current run up to twenty-five volts in six minutes and then held at that voltage ten minutes.

BY DR. W. V-B. AMES, CHICAGO, TAKING PLACE OF DR. J. O. ELY.

No. 11. Obtained electro-cocaine anæsthesia in a second lower molar pulp which had been in an inflamed state for a week, making it such a case as requires an objectionable expenditure of time to accomplish anæsthesia, because of the necessity of spending much time over the preliminary anæsthesia which renders possible the crowding of the process. The apparatus used was made by Mr. M. L. Franklin, of St. Louis.

Some time was lost by the accidental dislodgment of electrodes, and the operator's unfamiliarity with the apparatus. About one hour was consumed in obtaining such anæsthesia as would admit of depletion of the congested pulp. Then complete anæsthesia was obtained merely for the purpose of establishing the scientific fact that all inflamed pulps can be anæsthetized by expending sufficient time.

BY D. S. W. LAKIN, EUREKA.

No. 12. Restoration of the incisal third of the crown of a left upper central incisor.

The seat was ground flat in all directions, and retention was

made by means of screw posts located each side mesio-distally of the pulp chamber. Watts' crystal gold was used with hand mallet, and a plugger made by breaking off the serrated end and condensing the gold with the crystallized surface of the steel.

The patient, a boy about fifteen years old, became restless and the filling was not given the finish and polish called for in a good operation.

The building up of the filling and cohesion of the gold appeared to be strong and as perfect as to be expected under a serrated point.

BY DR. C. P. PRUYN, CHICAGO.

No. 13. Patient of Dr. H. A. Potts, Bloomington. Insertion of a large gold filling in a mesio-occlusal cavity of a right upper first molar, using a small amount of noncohesive at the gingival margin, the balance cohesive. The clinic demonstrated a unique method of applying the rubber dam in cases of extreme proximal decay, extending rootwise from the gingival margin. This was done by stretching one hole in the dam over the tooth to be operated upon and the one situated mesially to it. Much of the gingiva of the interproximate space had been destroyed so that an orange wood wedge was inserted to separate the teeth and hold the dam well away from the gingival margin and also to maintain dryness.

The operation was a success in that the entire cavity was well exposed especially the gingival margin and wall. Ample space was gained for restoring full contour and to permit of giving a good finish. There was no indication of moisture during the operation.

A subsequent clinic on the same method of applying the rubber dam was made on a right lower second bicuspid and first molar. The mouth being filled with water in this case also, and perfect dryness of the field of operation was maintained.

BY DR. G. B. DILLON, STERLING.

No. 14. A gold filling in a disto-occlusal cavity of a left upper second bicuspid. Sufficient space for filling and finishing was gained by means of the Ivory separator, and a matrix of thin copper was used. The object of the clinic was to demonstrate the possibility of gaining sufficient space by immediate separation for restoration of full contour and finishing, and considered from this standpoint was successful.

Your reporter would respectfully suggest that in his opinion the buccal and lingual wall should have been extended in their entire length to render them self-cleansing, instead of the margins being cut convex to the buccal and lingual. This would have materially increased the seat in the gingival wall which in cavities of this class and extent is important and necessary.

A second point noticed was that in the condensation of the gold at the buccal and lingual margins, the plugger was held parallel with these margins instead of being inclined to them which was necessary, in our judgment for perfect adaptation.

BY DR. C. B. SAWYER, JACKSONVILLE.

No. 15. A disto-occlusal cavity in a left upper second bicuspid was filled with Dr. G. V. Black's modified alloy. At the conclusion of the operation the marginal adaptation appeared good so far as one could see before the filling was polished, which of course had to be deferred for another appointment to allow it to harden. The filling lacked full contour as there had been insufficient separation made.

BY DR. L. E. CUSTER, DAYTON, OHIO.

No. 16. Demonstrated use of improved electric furnace which does not burn out in practical use, by baking two gum sections. Also made an exhibit of Ash's gum body that will fuse on English teeth without changing their color.

BY DR. B. D. WIKOFF, CHICAGO.

No. 17. Making crown porcelain face bicuspid without heating facing. The facing being retained on the backing by bending the pins over same after all soldering is done.

BY DR. G. A. THOMAS, CHICAGO.

No. 18. Baking a full upper continuous gum denture. The fusing of a porcelain crown on platinum cap, and an entire molar built up on a platinum cap. All fusing being done in the Peck electric furnace. The advantages claimed by the makers of this furnace are that it does not need a rheostat, and that the work is in plain sight during the process of baking.

BY DR. E. T. BRIGHAM, WATSEKA.

No. 19. A method of using vulcanite teeth, bicuspids and molars in bridge work. The prominent point of this clinic was

the backing of rubber teeth by filing off heads of pins and soldering without investment, backing same with gold of 32 gauge.

BY DR. T. W. BROPHY, CHICAGO.

No. 20. This was an exhibition of patient by Dr. Brophy, who had previously performed an operation for empyema of the antrum which involved the frontal sinus and ethmoid cells. It was found at the time of the operation that direct communication existed between the frontal sinus and the antrum. A tube was introduced in the frontal sinus for the purpose of facilitating irrigation. Treatment, antiseptic cleanliness.

DR. F. B. NOYES, CHICAGO.

No. 21. Found it out of the question to obtain the necessary facilities to make his clinic, and was excused.

BY DR. W. V-B. AMES, CHICAGO.

No. 22. In place of Dr. J. O. Ely, Chicago, who was unavoidably absent.

DR. DON M. GALLIE, CHICAGO.

No. 23. Excusably absent. Place filled by Dr. J.E. Hinkins, Chicago.

No. 24. One of Dr. C. P. Pruyn's clinics was in lieu of Dr. I. A. Freeman, who was excusably absent.

DR. R. M. PEARCE, ROCK ISLAND.

No. 25. Was present and ready to perform his clinic, but not finding a suitable case in time, was excused.

No. 26. Dr. Nels Nelson, Chicago, was absent for good and sufficient reasons.

No. 27. Dr. P. J. Kester, Chicago, gave to the Supervisor what he deemed sufficiently good reasons to excuse him from making the clinic.

No. 28. Dr. J. H. Woolley, Chicago, gave good reason for his absence.

No. 29. Dr. C. H. West, Farina, owing to recent serious illness could not attend the meeting.

No. 30. Dr. F. Primrose, Springfield, failed to give notice for absence.

In conformity to a standing resolution of the Executive

Council of this society prescribing the duties of the Supervisor of Clinics, which reads in part: "His report shall contain as thorough a criticism as possible * * * a statement of what he would have thought a better method * * * to the end that profitable and instructive discussion may follow." The Supervisor and those assisting in making this report have conscientiously endeavored to comply. Animated with the hope that whatever of criticism herein contained will be received as kindly as given, and that the future clinics of this society will continue to grow in interest and profitableness, this report is respectfully submitted.

T. W. PRITCHETT, *Supervisor.*
GARRETT NEWKIRK, }
B. NEWSOME, } *Assistants.*

DISCUSSION ON: "TO WHAT EXTENT ARE WE JUSTIFIED IN USING CATAPHORESIS AND IS THERE DANGER OF INJURING THE DENTAL PULP AND OTHER TISSUES BY ITS USE?"

Dr. W. V-B. Ames was called upon to open the discussion. He said: In answering the second question the first is effectually disposed of, as I understand it, for in proportion to the probability of injury to tissue, would the process be contraindicated. If there is no probability of injury to tissue we are then justified in employing the process whenever the conditions call for this form of anæsthesia and the patient is willing to recompense us for the time required if we are considering it wholly from a pecuniary stand, and oftener if from the point of charity and humanity.

I have heard recited a number of cases of bad results which seem to have followed the use of cataphoresis. I have not had any experience which would contraindicate its use, wherever it seems to be called for, but in carefully studying this subject I can see what might possibly be causes of some of the bad results, but I cannot give a scientific reason. I believe Dr. Black has thrown out the suggestion that there may be a possibility of carrying—I do not remember the exact term he used—ptomaines into the tissues.

Dr. Peck: I believe the term used by Dr. Black was toxalbumin.

Dr. Ames: What is a ptomaine?

Dr. Peck: A ptomaine is the product thrown off by the living bacteria.

Dr. Ames: Whether of an alkaline nature or not?

Dr. Peck: That I cannot say in all cases. It will depend upon the class of microörganisms we are dealing with.

Dr. Ames: I am endeavoring to ascertain some facts in this connection, and I am told that there is an alkaline product thrown off by the bacteria. I had supposed that the effete matter thrown off by the microörganisms was acid, while if there is a poisonous

alkaline product there of any kind it would be carried toward the negative pole, the same as the alkaloid cocaine. It seems to me this is the only possible explanation for the injurious results of which we have heard so much, following cataphoresis. I have not seen such cases myself. While I am an enthusiast in this matter, I do not use it on every patient or on the majority of my patients. I may work along for two weeks without seeing the necessity of employing cataphoresis. In the use I have made of so-called cataphoresis I have not seen bad results and such results may have been directly attributable to the fact that some poisonous matter may have been carried in, which would, on account of its chemical nature, go to the negative pole the same as cocaine does.

"Is there danger of injuring the dental pulp or other tissues by its use?" When an infinitesimal quantity of cocaine is introduced into the pulp tissue, I believe the pulp will rally, and I feel when we have accomplished the results we have simply carried the cocaine into the pulp tissue to the extent we need for the anæsthesia. When we are able to bring the anæsthesia to the point where the patient is not conscious of the current any more, we stop there; we do not carry the cocaine effect into the tissues beyond. I do not see where the disadvantage would be, even if we did carry it into the tissue beyond. It goes into the circulation of the pulp, and is carried off just as a patient recovers from general anæsthesia.

Dr. S. F. Duncan, Joliet: I have been using cataphoresis to some extent for a few months, and there is no question about the matter as to whether we can anæsthetize a pulp or tooth with it. We know we can. I must confess of having had a little fear in using it. I have always been afraid of the reaction after the effect of the cocaine has passed away, and question whether the reaction would not produce a condition of the pulp that might eventually result in its death. That is the principal fear that I have had in the use of it.

So far as burning the gum or anything of that kind is concerned, I have not had any unpleasant or bad results from it in that way.

Dr. J. A. W. Davis, Galesburg: My partner and I have been using cataphoresis for nearly a year. We use it quite frequently and have not had any bad results. In a case in which the pulp is inflamed we do not succeed as well. We have not had a case, so

far as I know, where there has been any trouble after the tooth has been filled. We destroy the pulp with it, take it out, and fill immediately in every case. It does not take more than half an hour to forty minutes to destroy the pulp. It is generally done without any pain, but occasionally there will be a case where the patient will complain of pain in having the pulp removed with cataphoresis.

We have the Wheeler volt selector and a part of the works of a clock being attached to it—by letting the band which runs the dental engine pass over one of the wheels the volt selector is turned so gradually by the motor that the patient does not notice it.

Dr. A. H. Peck: I simply wish to state regarding the micro-organisms or their products, or whatever it may be that is carried into the tissue by the current, that Dr. Black's idea is that it will destroy any and all living tissue with which it comes in contact, the idea being, I presume, that if any of these ptomaines are carried by the current into the tissues, they will irritate the pulp, and the pulp in turn will be destroyed by them.

Dr. C. S. Case: This is a subject that I know very little about, but there is one point that has struck me very forcibly, and that is, the claim made at this meeting, and the Chicago Dental Society, in reference to carrying broken down ptomaines and other substances as substance along on the current. It seems to me, that this is something we have nothing specially to deal with. It is going beyond the possibility of our brain to attempt to say just how the causes of the effects are. It is not possible in my opinion, for any substance or chemical compound or any decomposed particles to be carried along on a current of electricity. What is it that produces the anæsthetic effect? It is something that sets up a vibratory force, which in turn inhibits the activities of the nerves and produces a deadening of the sensibility. Probably it is purely a vibratory action; but we may never know.

There is no doubt in my mind but that all local and general anæsthetics act by virtue of the inhibitory power upon vibrations, and when we use electricity along with cocaine we merely intensify the activity of the drug. You might as well say that you can carry substances along the current of a telephone wire; or something besides vibrations or whatever the unknowable force is that transmits the human voice.

I see no reason why we should so frequently feel called upon

to give a specific account of objective phenomena that belongs to a realm of which we can ever know little or nothing.

Dr. Edmund Noyes: It is equally possible, as a matter of theory, that the cocaine itself as a physical body is carried to the pulp and affects it as it is, that the effects upon the pulp are purely dynamic. The facts that cocaine applied to such a cavity will not produce these effects, and the electric current alone will not produce them, and the electric current is used in other situations for the sake of the more rapid diffusion of medicines into a wider territory, all these make it plausible that the cocaine itself penetrates the dentinal tubuli and affects the pulp, and not merely as a dynamic vibratory force. I am not saying that is so. This is a subject that we are anxious to know more about both clinically and scientifically. The question arises whether the poisonous products of the decompositions that are going on in the cavities of teeth may not be diffused by the stimulation of the electric current, and eventually carried to the pulp and poison it by the same means and under the same stimulus that the electric current carries the cocaine there. I am anxious to know whether there is a clinical history of dying pulps following the use of cataphoresis, and that question I have not heard answered with any definiteness or with any detail.

Dr. P. J. Kester, Chicago: The question of the transmission of sensation over the nerve or the destruction of sensation in the nerve by cataphoresis is one of great interest. A few days since some one kindly sent us a dental journal in which there was an article by F. X. Dercum entitled "The theory of the movement of the neuron" nerves. I have not studied the article carefully, but after having read it once, it seems to me to be the most reasonable explanation of the transmission of nervous force that I have seen. It was described as a sensation depending upon an extension of the protoplasmic processes of the neuron of the nerve cells; that as the nerve was irritated these processes were extended until they approached each other, and it was through the contact of these processes that nervous energy was transmitted. The author also explained the conditions of hysteria, insomnia, and other things, describing them as an irritation or extension of these processes. At the time of sleep or inactivity, these processes are quiescent and do not approach each other, but under irritation and excitement they extended them-

selves and formed a circuit which produced peculiar nervous sensations, and when these sensations are abnormal they become indications of disease, more particularly in the nervous diseases like hysteria and other affections.

The statement was made by some one that the anæsthesia produced by cataphoresis depends on two things, the presence of cocaine and the electric current. Dr. Perry seems to have demonstrated that cocaine is absolutely unnecessary. He finds that he can produce anæsthesia of the pulp to a degree sufficient to remove it, by the application of the current alone. So the condition of anæsthesia depends more upon the action of current upon the protoplasmic prolongation from the pulp into tubuli, with the retraction of the neuron of the pulp proper than it does on the remedy which is supposed to be transmitted through the hard tissues.

Dr. E. T. Brigham, Watseka: I have only had a limited experience with cataphoresis. With it, as with everything else in our practice, we cannot use it on every patient with success. It would not do to apply it to every case that comes to you. There are cases, however, where it is beneficial. I have used it several times with success, and in other cases without success. As Dr. Kester has just said, it is hardly ever a success without the use of cocaine. I have tried it without moistening the cavity and have always failed. I have failed also where I have used cocaine, but in the majority of cases in which I have used cocaine, and my patient was a good subject, I have had perfect success. I believe it is a good thing. As to whether it will injure the pulp afterward, I cannot say.

Dr. J. G. Reid: I believe the subject under consideration is a very important and interesting one, and it is now in a state of exalted sensibility, if you please, and we are inclined to jump at things of this character because certain results have been obtained. This is the natural inclination, and we are striving to get something with which to relieve the pain and remove the horror of dental operations. I am free to admit that cataphoresis comes more nearly filling the requirements than anything that has been used heretofore; at the same time, it is an agent that we know very little about. We may regret that we are using it to the extent we are at present. Of course, we hope not, but we may, and my experience with the use of it has been rather conservative. That it does what it is intended to do there can be no question, and if you have failures in

accomplishing what you start out to do, I do not believe it can be attributed to cataphoresis itself, but rather to some defect in your apparatus or in your application. I will be honest in saying, that I have never in all my experience had a failure with the use of the machine. I have had what seems to be impartial anæsthesia, but I can account for that on the ground of not following out certain details in order to make the operation a success. I did not carry the process to the extent of complete anæsthetization of the pulp, which I think can be done in every instance if time is taken to do it. I believe we can anæsthetize the contents of the tubuli without anæsthetizing the entire dental pulp, and if anything should arise in the way of injury to the pulp, of course you could prevent it. In my opinion it is only necessary to anæsthetize to the depth to which you intend to cut in the dentine. Of course, the density of the dentine and the conditions existing in it, in all probability, vary the application of the current, and you cannot determine beforehand to what extent anæsthesia has taken place except by trial. There is no rule to govern us in this regard.

I do not believe it is a good agent to use for the extirpation of dental pulps. We make a great mistake in using cataphoresis for the purpose of removing pulps of teeth. There are times when this would be advisable, particularly in cases of emergency. In emergency cases it might be desirable to use cataphoresis to remove the dental pulp, but I have my doubts about being able to do so at one sitting. You are all familiar with the tissues of dental pulps; you know they are tenacious, and that it is almost impossible by employing the old methods of destroying pulps to remove them in their entirety. In the majority of cases they are very hard to remove, and how much more difficult are they to remove in the condition which exists than they would be if allowed to go a certain length of time, so that nature might assist us in getting rid of that tissue. If allowed to go a little while you can pull out the pulp in little threads; but you are never sure of removing the entire pulp at one sitting, when you have used cataphoresis for anæsthetization and for its removal.

Hæmorrhage in many cases is a very conspicuous feature, and we must not, if possible, allow the accumulation of blood clots in the pulp canal which naturally will occur, and when they are allowed to remain in the pulp canal for subsequent decomposition to take place they are an element of danger. It is not in all cases

that hæmorrhage occurs, but it does occur in many of them, and I believe on account of hæmorrhage and its control, that cataphoresis is not a good agent for the immediate extirpation of pulps.

I have used cataphoresis for a year, but I do not use it daily because of the time consumed in its application. If I have cavities that require half an hour or more in their preparation, I would save the time by using cataphoresis in the end. In a measure the dentist regulates his patients; he has people coming to him constantly who are under his care, and he does not allow the cavities to become so large as to require a day to prepare and fill them. The cavities that I ordinarily get, not in all instances, can be prepared in ten or fifteen minutes. Now, it would be a waste of time for me to use cataphoresis in such cases, and consequently I am deprived of using it more frequently than I do. I should hesitate to use it constantly.

Dr. G. M. Brunson: There are one or two questions I would like to ask Dr. Davis. First, if he uses cataphoresis extensively in excavating sensitive cavities. He spoke of the extirpation of pulps with its use.

Dr. Davis: Not extensively, but quite often, not even every day, unless I have to.

Dr. Brunson: In regard to cataphoresis, it is certainly very useful to us at various times. But there are some objections to its general use. First, the amount of time it takes to use it in our general practice; second, the danger to the pulp. None of us can now positively tell whether or not these pulps may not be injured or die months or even years after its application. If any of the members of the Illinois State Dental Society use cataphoresis extensively in excavating sensitive dentine, I should like to hear their views on the subject.

Dr. R. N. Lawrance: I have been using cataphoresis for probably ten months in a conservative way for the excavation of sensitive dentine, the extirpation of pulps, for the extraction of teeth and for the sterilization of putrescent root canals, and I only use it in cases where it seems to be absolutely necessary, particularly so far as the excavation of sensitive dentine is concerned. I would not resort to it if I could get along without it.

Dr. Black has made the suggestion that the excrement from the cocci or germs might be carried through the tubuli to the detriment of the pulp. There may be something in this, or there

may not be. My understanding is that electricity itself may not produce any serious results, but the carrying of the medicine or any germs into the tissues or their ptomaines might produce deleterious results in the future, and as a consequence it would eventually cause death of the pulp. I have had excellent success in obtunding sensitive dentine with cataphoresis, and also in the extraction of teeth, but I have not used it very much for the latter purpose. The guaiacol preparation would be satisfactory in the main, with the exception that it takes too much time and the escharotic effects of the guaiacol are unpleasant, and on this account I have abandoned it so far as that is concerned. I have tried it in two instances for the sterilization of pulp canals, and I set up considerable irritation. I have no doubt that I carried some of the ptomaines through. I only used chloride of sodium and it created a good deal of irritation. My fear in connection with its use has been that we might produce in sensitive dentine a certain amount of paralysis by long continued use, and that the pulp would die afterward.

As to the current carrying physically any of these germs or their ptomaines, I have my doubts. I do not question Dr. Black's judgment in this matter.

Dr. P. J. Kester: I regret that this subject did not come up a little earlier in the session, because it is one of importance. I have used cataphoresis somewhat, but have been afraid that its after effects might be detrimental to the pulp. We have not used it long enough to discover the bad results or to see the manifestations from such disturbances. We know that a pulp may die in a tooth and under favorable conditions remain quiescent for years. I believe that we ought to use cataphoresis very carefully until it has been demonstrated that there is little or no danger attending its use. We also know that pulps die from what would seem to be insufficient irritation, such as changes in temperature and slight shock, and the question arises if the shock which absolutely deadens the pulp, may not be sufficient to entirely destroy it.

I want to enter my protest against the practice of extirpating pulps by this method. I know it is possible to extirpate a pulp by cataphoresis, fill the cavity immediately, and have apparently good results. I do not believe it is scarcely possible to remove all of the particles of the pulp and thoroughly prepare the root for filling at one sitting. I do not believe a cavity under such circum-

stances is in a good condition to fill. In rare cases it may be done, but the practice is a dangerous one and will be unsatisfactory.

Dr. W. V-B. Ames: On seeing the program I prepared to show some experiments and to demonstrate a few of the underlying principles of so-called cataphoresis, which I claim is simply an electro-chemical process. Later I was asked to take the place of Dr. Ely as clinician. I have had some transparent preparations made in which I was going to show the actual transmission of compound substances and simple substances, and to point out that they are not always carried from positive to negative. The carrying of substances into the tissue is simply the transmission of electro-positive and electro-negative elements in certain directions according to their affinities or nature. So I claim, as I did before the Chicago Dental Society, when I took another man's place and opened the discussion, that there was no excuse for coining the word cataphoresis, according to my opinion. The term is convenient enough, but there is nothing scientific about it, except that the name is suggested by the cathode. The general impression is that cataphoresis is something occult, as Dr. Case would infer; that it is something we have no way of getting at, and some seem to think we will never know anything about it; that it is a peculiar flow created by the current, carrying with it whatever you may put there. It is not the case at all. I am satisfied there is a flow, but it is created by the elements which are set in motion by the polarity established, the positive elements traveling toward the negative and the negative toward the positive. As the electro-negative or electro-positive elements predominate in the compound, the flow of the solvent will be created in the direction of the movement of the elements which predominate. This flow is a secondary matter, depending upon the predominance of one or the other elements. In the majority of compounds there is a predominance of the electro-positive elements which would go to the negative pole; in the majority of instances the flow is in that direction. Ordinarily with water you have your H_2O, you have twice as much volume going in one direction as the other; you have a flow created in that direction. In the solution of hydrochlorate of cocaine I cannot give the formula off-hand, but you have HCl and the cocaine formula which gives you forty to fifty volumes of alkaloid in proportion to two volumes of acid. You

have one going in one direction, the other in the opposite direction; you have a great volume comparatively going toward the negative pole, and your HCl remaining at the positive. There is the whole thing to me in a nutshell. It is not the flow you create which does the work, but it is the carrying of potent substances in a certain direction where you want to place them, and the flow is secondary.

I want to protest against people talking about this process and saying, "I have used this machine for this and that condition." With all deference to my friends, it hurts my feelings to hear them speak of using this machine with which to do certain things. I would not quarrel over a term if it is convenient and answers the purpose. If I were to suggest a term, I would call it the electrolytic transmission of radicals, or simply "electrolysis," which means simply a breaking up of the compound and carrying the radicals in two directions. The radical may be a simple element, or it may be compound.

Reference has been made to the use of cataphoresis for the purpose of immediately extirpating pulps and filling root canals. I do not use it that way myself. I have, however, in one or two cases of emergency attempted to do such a thing, but I should say it would be only excusable in emergency cases, and even then I should want to do it over when an opportunity presented itself.

I would object to working my device in a given way, as, for instance, by clock work, as referred to by Dr. Davis, for the reason that there are no two cases alike. You may have a case where you can turn the current on rapidly, but in a case where the pulp is inflamed you have to go very slowly.

I would not use the guaiacol solution spoken of by Dr. Lawrance, for I believe he can accomplish just as much with a plain water solution or a solution of electrozone, and it has not the objectionable effects of the guaiacol.

APPENDIX.

LIST OF OFFICERS

. . OF THE . .

ILLINOIS STATE DENTAL SOCIETY,

FROM DATE OF ORGANIZATION.

ORGANIZED AT CHICAGO, JULY 24, 1865.

CHAIRMAN, A. C. Van Sant, Princeton. SECRETARY, E. Honsinger, Chicago.

Ann'l meeting.	Year.	Place.	President.	Vice-President.	Secretary.	Treasurer.	Librarian.
1	1865[1]	Chicago....1st.	A. C. Van Sant..Princeton.	E. Honsinger ...Chicago.	Edgar Park.....Chicago.	S. Babcock...Springfield.	T. N. Truesdell.....Elgin.
2	1866	Chicago.....2d.	H. N. Lewis.....Quincy.	O. Willson.....Aurora.	G. T. Smith...Princeton.	M. W. Sherwood.Chicago.	L. P. Haskell.....Chicago.
3	1867	Chicago.....3d.	Geo. H. Cushing...Chicago.	A. W. French.Springfield	M. S. Dean.....Chicago.	J. N. Crouse..Mt. Carroll.	W. W. Allport.....Chicago.
4	1868	Springfield.1st.	E. H. Kilbourne....Aurora.	G. P. Kingsley..Freeport.	H. J. Smith.....Quincy.	A.W. French..Springfield	M. S. Dean.....Chicago.
5	1869	Quincy.....1st.	M. S. Dean.....Chicago.	G.V. Black..Jacksonville	C. S. Smith...Springfield.	A.W. French..Springfield	C. O. Dean..Mount Carroll.
6	1870	Bloomingt'n 1st	M. S. Dean[2].....Chicago.	G.V. Black[2]..Jacksonville	C. S. Smith[2]..Springfield.	A.W. French[2] Springfield	C. O. Dean[2].Mount Carroll.
7	1871[3]	Peoria.....1st.	G. V. Black ..Jacksonville.	S.C.Wilson.Bloomington	C. S. Smith...Springfield.	G. P. Kingsley..Freeport.	E. C. Stone.....Galesburg.
8	1872	Chicago....4th.	O. Willson..... ...Aurora	J. N. Crouse.....Chicago.	C. S. Smith...Springfield.	G. P. Kingsley..Freeport.	J. M. Hurtt.....Peoria.
9	1873	Rock Island 1st	J. N. Crouse .....Chicago.	S. L. Edwards ....Peoria.	C. R. E. Koch....Chicago.	S. M. Sturgiss....Quincy.	J. M. Hurtt.....Peoria.
10	1874	Jacksonville 1st	C. Stoddard Smith.Spri'g'd	E. Honsinger....Chicago.	C. R. E. Koch....Chicago.	S. M. Sturgiss....Quincy.	R. Matthews.....Pontiac.
11	1875	Ottawa .....1st.	G. S. Miles.....Jerseyville.	E. D. Swain. ....Chicago.	C. R. E. Koch....Chicago.	C. A. Kitchen. ....Galva.	F. W. Dean.....Pekin.
12	1876	Galesburg..1st.	E. D. Swain.....Chicago.	K. B. Davis, Petersburg.	C. R. E. Koch....Chicago.	C. A. Kitchen..Rockford.	O. Willson.....Aurora.
13	1877	Springfield..2d.	K. B. Davis ....Springfield.	E. C. Stone....Galesburg.	E. D. Swain.....Chicago.	C. A. Kitchen..Rockford.	E. B. David.....Aledo.
14	1878	Rockford...1st.	C. R. E. Koch.....Chicago.	S. M. Sturgiss....Quincy.	E. D. Swain.....Chicago.	C. A. Kitchen..Rockford.	E. B. David.....Aledo.
15	1879	Peoria.....2d.	S. M. Sturgiss.....Quincy.	C. A. Kitchen, Rockford.	Edmund Noyes..Chicago.	E. C. Stone....Galesburg.	W. W. Ormsbee....Geneva.
16	1880	Bloomington 2d	C. A. Kitchen ....Rockford.	J. Frank Mariner, Ottawa	Edmund Noyes..Chicago.	E. C. Stone....Galesburg.	G. H. Harrington..Delavan.
17	1881	Rock Island 2d	J. Frank Mariner..Ottawa.	J. A.W. Davis, Galesburg	Edmund Noyes..Chicago.	E. C. Stone....Galesburg.	G. H. Harrington..Delavan.
18	1882	Quincy.....2d.	A. W. Harlan.....Chicago.	W. T. Magill, Rock Island	Edmund Noyes..Chicago.	E. C. Stone....Galesburg.	H. H. Townsend...Pontiac.
19	1883	Decatur.....1st.	E. C. Stone.....Galesburg.	J. J. R. Patrick, Belleville	Edmund Noyes..Chicago.	E. S. Talbot.....Chicago.	H. H. Townsend...Pontiac.
20	1884	Springfield. .3d.	Edmund Noyes....Chicago.	H. H. Townsend, Pontiac	J. W. Wassall[4]..Chicago.	J. Campbell..Blooming'n	W. B. Woodward....Peoria.
21	1885	Peoria.....3d.	H. H. Townsend...Pontiac.	M. H. Patten, Springfield	J. W. Wassall[5]..Chicago.	C. R. Dwight....Danville.	J. W. Cormany..Mt. Carroll.
22	1886	Rock Island 3d.	T. L. Gilmer.....Quincy.	W. B. Woodward, Peoria.	J. W. Wassall[6]..Chicago.	C. B. Rohland.....Alton.	W. B. Ames.....Chicago.
23	1887	Jacksonville. 2d	W. T. Magill..Rock Island.	C. B. Rohland.....Alton.	J. W. Wassall[7]..Chicago.	T. W. Prichett. Whitehall	W. B. Ames.....Chicago.
24	1888	Cairo.....1st.	C. B. Rohland.....Alton.	Chas. Henry, Jackson'ville.	Garrett Newkirk. Chicago	T. W. Prichett. Whitehall	W. B. Ames.....Chicago.
25	1889	Quincy.....3d.	Geo. H. Cushing...Chicago.	J. J. Jennelle.....Cairo.	Garrett Newkirk. Chicago	T. W. Prichett. Whitehall	W. B. Ames.....Chicago.
26	1890	Springfield. 4th.	T. W. Prichett..Whitehall.	Kate C. Moody, Mendota.	Garrett Newkirk. Chicago	W. A. Stevens...Chicago.	D. M. Cattell.....Chicago.
27	1891	Bloomington 3d	Truman W. Brophy. Chicago	E. K. Blair.....Waverly.	Garrett Newkirk. Chicago	W. A. Stevens...Chicago.	F. H. McIntosh..Bloom'g'n
28	1892	Springfield. 5th.	W. H. Taggart...Freeport.	Garrett Newkirk. Chicago	Louis Ottofy.....Chicago.	W. A. Stevens...Chicago.	F. H. McIntosh..Bloom'g'n

[1] Two meetings were held in Chicago, July and November; all succeeding meetings were held in May.
[2] These officers held over from the previous meeting, no election being held at the close of meeting of 1869.
[3] The officers acting at this and succeeding meetings were elected and installed at the close of the previous meeting.
[4] Assistant Secretary, W. H. Taggart, Freeport.
[5] Assistant Secretary, P. J. Kester, Chicago.
[6] Assistant Secretary, P. J. Kester, Chicago.
[7] Assistant Secretary, Louis Ottofy, Chicago.

Ann'l meeting.	Year.	Place.	President.	Vice-President.	Secretary.	Treasurer.	Librarian.
29	1893	Rock Isl'd..4th	E. K. Blair.....Waverly.	C. N. Johnson...Chicago.	Louis Ottofy....Chicago.	W. A. Stevens...Chicago.	F. H. McIntosh, Bloom'g'n
30	1894	Springfield..6th	Garrett Newkirk..Chicago.	J.W.Cormany.Mt.Carroll	Louis Ottofy....Chicago.	W. A. Stevens...Chicago.	F. H. McIntosh, Bloom'g'n
31	1895	Galesburg ...2d	J. W. Cormany.Mt. Carroll.	S. F. Duncan.....Joliet.	Louis Ottofy....Chicago.	W. A. Stevens...Chicago.	Grafton Munroe, Spring'ld
32	1896	Springfield..7th	W. A. Stevens ...Chicago.	C. R. Taylor....Streator.	Louis Ottofy....Chicago.	E. D Swain ....Chicago.	J. R. Rayburn...Fairbury.
33	1897	Peoria 4th	C. R. Taylor.....Streator.	E. B. David.....Aledo.	Louis Ottofy....Chicago.	E. D. Swain ....Chicago.	J. R. Rayburn...Fairbury.
34	1898	Springfield .8th	J. A. W. Davis..Galesburg.	W. A. Johnston...Peoria.	A. H. Peck.....Chicago.	E. D. Swain.....Chicago.	Grafton Munroe. Spring'ld
35	1899						
36	1900						
37	1901						
38	1902						
39	1903						
40	1904						
41	1905						
42	1906						
43	1907						
44	1908						
45	1909						
46	1910						
47	1911						
48	1912						
49	1913						
50	1914						
51	1915						
52	1916						
53	1917						
54	1918						
55	1919						
56	1920						
57	1921						
58	1922						
59	1923						
60	1924						
61	1925						
62	1926						
63	1927						
64	1928						
65	1929						
66	1930						
67	1931						
68	1932						
69	1933						

OFFICERS AND STANDING COMMITTEES.

OFFICERS, 1897-98.

President, J. A. W. Davis.....Galesburg.
Vice President, W. A. Johnston.....Peoria.
Secretary, A. H. Peck .....Chicago.
Treasurer, E. D. Swain.....Chicago.
Librarian, Grafton Munroe.....Springfield.

EXECUTIVE COUNCIL, 1897-98.

Ex Officio..... J. A. W. Davis, Galesburg.
A. H. Peck, Chicago.
E. D. Swain, Chicago.

Terms expire 1898 ..... E. B. David, Aledo.
Edmund Noyes, Chicago.
Robert Goebel, Lincoln.

Terms expire 1899 ..... J. G. Reid, Chicago.
R. N. Lawrance, Lincoln.
L. W. Skidmore, Moline.

Terms expire 1900..... Geo. H. Cushing, Chicago.
E. H. Allen, Freeport.
A. S. Waltz, Decatur.

STANDING COMMITTEES.

EXECUTIVE COMMITTEE.

E. H. Allen.....Freeport.

COMMITTEE ON PUBLICATION.

A. H. Peck, Chairman.....Chicago.
E. Noyes.....Chicago.
C. N. Johnson.....Chicago.

BOARD OF EXAMINERS.

E. D. Swain, (term expires 1898).....Chicago.
C. B Rohland, " " 1899).....Alton.
Robert Goebel, " " 1900).....Lincoln.

COMMITTEE ON DENTAL SCIENCE AND LITERATURE.

A. W. Harlan.....Chicago.

COMMITTEE ON DENTAL ART AND INVENTION.

J. E. Keefe.....Chicago.

COMMITTEE ON INFRACTIONS OF THE CODE OF ETHICS.

C. R. E. Koch.....Chicago.
D. E. Coulson.....Galesburg.
W. E. Holland.....Jerseyville.

CLINICS.

E. K. Blair, Supervisor.....Waverly.

LOCAL COMMITTEE OF ARRANGEMENTS.

Grafton Munroe.....Springfield.
G. H. Henderson.....Springfield.
L. O. Frazee.....Springfield.

CONSTITUTION AND BY-LAWS.

ARTICLE I.

Name.

This Society shall be called "The Illinois State Dental Society."

ARTICLE II.

Aims and Objects.

Its aims and objects are as follows: The elevation of the standard of professional education; the advancement and cultivation of dental science and literature, and the protection of the public from the evils of empiricism; the promotion of the honor, usefulness and interest of the dental profession and mutual fellowship and good feeling.

ARTICLE III.

Officers.

The officers of this Society shall consist of a President, Vice President, Secretary, Treasurer and Librarian, and such others as may be designated in the by-laws or standing resolutions.

ARTICLE IV.

Executive Council.

The management of this Society shall be vested in an Executive Council consisting of twelve active members of whom the President, Secretary and Treasurer shall constitute a part, and these shall be the officers of the Council.

ARTICLE V.

Duties of Executive Council—Election of President and Vice President, Appointment of all Other Officers, and Selecting Place of Next Meeting.

The Executive Council shall have exclusive control of all the business of the Society and their action shall be final, without review by the Society, except as otherwise provided.

At the morning session of the last day of the annual meeting the Society shall proceed to elect a President and Vice President by ballot. The first ballot shall be informal, and in no case shall a ballot be dispensed with.

The Council shall appoint or elect all other officers, and standing committees, and shall select the place of annual meeting. In case of the absence from the meeting of the President and Vice President or of any other officers, the Council shall appoint others to act in their places.

ARTICLE VI.

Election of Executive Council.

At the first election of the Executive Council held under the amended constitution, nine members shall be elected, who shall serve—three for one year—three for two years—and three for three years—their terms to be decided by lot after their election. At each subsequent annual meeting three members of the Council shall be elected by the Society to serve for three years.

ARTICLE VII.

Quorum.

Seven members of the Executive Council shall be necessary to constitute a quorum. If at any annual meeting a quorum should fail to be present, the members of the Council present shall appoint enough members of the Society to constitute with themselves a quorum, who shall serve until the arrival of the regular members of the Council.

ARTICLE VIII.

Members.

Section 1.—This Society shall consist of Active, Corresponding and Honorary Members.

Active Members.

Sec. 2.—The Active members shall consist of practitioners of dentistry residing in the State of Illinois (except as provided in Section 5, Article VII, of the By-Laws). They shall be twenty-one years of age, of good moral character, and shall have received a diploma from a respectable Medical or Dental College, or shall have been engaged three years in the practice of dentistry, including term of pupilage, and shall have passed a satisfactory examination before the Board of Examiners.

Corresponding Members.

Sec. 3.—Corresponding Members shall consist of practitioners of dentistry or medicine residing in this or other States of the Union, or in foreign countries, who manifest a disposition to advance the science and art of the profession by contributing to its literature.

Honorary Members.

Sec. 4.—Honorary Members shall consist of persons who have made valuable contributions to the science or art of dentistry, or have rendered important services to the profession.

ARTICLE IX.

Powers.

The Society shall use one common seal, with such device and inscription as it shall agree upon; and may, by vote of the Council, grant to its members such certificates as may authenticate their membership.

ARTICLE X.

Amendments.

The Constitution may be altered or amended, with the consent of two-thirds of the members of the Society present—the proposition stating the amendment (in writing) to be submitted by five members at an annual meeting and to lie over until the next annual meeting.

If the purpose and scope of such alterations or amendments be announced in writing at the annual meeting, or, if a general revision is desired to be made, and the society, or its executive council, shall appoint a committee to determine the details of such amendments, or to make such revision, the publication in the "Transactions" of such changes as are proposed to be made, or of such revised constitution, shall be deemed a sufficient compliance with the requirements of this section, and such proposed alterations, amendments, or revision, may be adopted or rejected at the next annual meeting thereafter.

BY-LAWS.

ARTICLE I.

OFFICERS.

Duties of the President.

Section 1.—The President shall preside at all meetings of the Society and Council, call special meetings of the Society at the request of ten active members, and of the Council at the request of three of its members; sign all diplomas, certificates, or letters testimonial; appoint all committees not otherwise provided for, and be *ex officio* a member of all standing committees.

Duties of the Vice President.

Sec. 2.—The Vice President shall, in the absence of the President, preside; and in case of the absence of both of these officers, a President *pro tempore*, shall be appointed by the Council.

Duties of the Secretary.

Sec. 3.—The Secretary shall keep minutes of all meetings, both of the Council and Society; notify officers and members of their election; give notice to members of all meetings; sign all diplomas, certificates and letters testimonial; receive all moneys due the Society from its members, and pay the same to the Treasurer, and certify to all official acts of the Society in connection with the President. He shall take charge of and conduct the correspondence of the Society, and shall keep a copy of all official letters he may write, with replies to the same. He shall be Chairman of the Publication Committee, and shall give a bond in amount as required by the Executive Council before entering upon his duties.

Duties of the Treasurer.

Sec. 4.—It shall be the duty of the Treasurer to keep all moneys of the Society committed to his trust; to pay them over by order of the President, countersigned by the Secretary, and keep a correct account of the same in a book pro-

vided for that purpose He shall make a full and detailed report of the financial affairs of the Society at the annual meeting each year; and at the expiration of his term of office, he shall deliver to his successor all funds, papers and books relating thereto, and shall give bond in amount as required by the Executive Council before entering upon his duties.

Duties of the Librarian.

Sec. 5.—The Librarian shall have charge of all books and manuscripts belonging to the Society. He shall keep an accurate catalogue of the same, and shall report at the annual meeting the condition of the Library, and contributions made to it during the year.

Publication Committee.

Sec. 6.—The President shall appoint annually, after the election of officers, two members of the Society, who shall act in conjunction with the Secretary, as the Publication Committee.

They shall be authorized to employ a competent reporter to furnish an accurate report of the proceedings of each meeting.

They shall superintend the publication and distribution of such portions of the Transactions as the Council may direct, or the committee judge to be of sufficient value, and shall have full authority and power to cut down, amend or leave out such matter as they deem best for the proper preparation of the Transactions for publication.

They shall specify, in their annual report, the character and cost of the publications of the Society during the year, and the number of copies still on hand. Any report or other paper entitled to publication in the volume of the Transactions for the year in which it shall be presented to the Society must be placed in the hands of the Publication Committee on or before the last day of the annual meeting, and must be also so prepared that the proof sheets furnished the authors shall be returned without material alteration or addition.

Every paper received by this Society, and all plates and other means of illustration, shall be considered the exclusive property of the Society, and shall be published for its benefit.

Disclaimer.

This committee is hereby instructed to print, at the beginning of each volume of the Transactions, the following disclaimer, *viz.*; "The Illinois State Dental Society, although formally accepting and publishing the reports of the various committees, and the essays read before it, holds itself wholly irresponsible for the opinions, theories, or criticisms therein contained, except when otherwise decided by special resolution."

ARTICLE II.

Election of the Executive Council.

At the election held first after the adoption of this amended Constitution. nine persons shall be chosen by the Society for members of the Executive Council, to serve for terms of one, two and three years respectively, or until their successors are duly qualified, and thereafter three members shall be elected annually to serve three years.

They shall be nominated with special reference to their fitness by a committee of three, to be appointed by the President, and only confirmed by a two-thirds affirmative vote of the members of the Society present.

The election of new members of the Council annually shall be held on the morning of the last day's session, but those newly elected shall only enter upon their duties after the close of the annual meeting at which they were elected.

ARTICLE III.

Duties of Executive Council.

The Executive Council shall have the absolute control of the entire business of the Society—and shall sit with closed doors.

How Business Shall be Brought Before the Council.

Any member of the Society desiring to bring any matter of business before the Council must do so in writing, and may appear before them to advocate any such measure by consent of the Council.

Whom They Shall Elect and Appoint.

They shall annually elect a Secretary, Treasurer and Librarian and appoint the Executive Committee, one member of the Board of Examiners, a Committee of three on Ethics, a Supervisor of Clinics, the Committee on Dental Science and Literature, the Committee on Dental Art and Invention and a Local Committee of Arrangements.

Officers and Members of Old Committees to Hold Over.

The officers of the Society and the members of the Executive Committee, of the Board of Examiners and of the Committee on Dental Science and Literature aud of Dental Art and Invention who are in office at the time this constitution goes into effect shall continue in office till their full terms expire.

Auditing Committee.

The Executive Council shall annually appoint an Auditing Committee from their own number.

How Moneys Shall be Voted.

They shall vote no moneys to be paid for other than the legitimate expenses of the Society except upon a three-fourths vote of all the members of the Council present.

Presiding Officer not to Vote Except in Case of a Tie.

The presiding officer of the Council shall not vote on any question, except in case of a tie, when he shall cast the deciding vote.

ARTICLE IV.

Executive Committee, and Duties of same.

There shall be an Executive Committee of one to be appointed by the Executive Council annually, whose duty shall be to provide a suitable hall for meetings and prepare the program of scientific work and order of business for each annual session, and attend to such other business as the Council may direct.

ARTICLE V.

Duties of Board of Examiners.

The Board of Examiners shall satisfy themselves by examination, or in any other manner they may think necessary, of the reputable character and professional qualifications of all candidates for membership, and recommend for election such as they find to be worthy.

ARTICLE VI.

Vacancies in the Board of Examiners.

In case of the absence from any meeting of one or more members of the Board of Examiners, the Council shall appoint substitutes to act *pro tempore*, and in case of a vacancy, occurring by death or otherwise, they shall, at the earliest time practicable thereafter, appoint some member to fill the unexpired term of such vacating member.

ARTICLE VII.

Election of Members.

Section 1.—Candidates for membership must be propcsed to the Board of Examiners, recommendations for the same being made in writing by two members of the Society, accompanied by the initiation fee, said fee being returnable to the applicant in case of rejection. The Board shall proceed to examine such candidates in accordance with the provisions of Article V. of these By-Laws, as early thereafter as practicable. Three-fourths of all the votes cast by the Council shall be necessary for the election of a member.

Sec. 2.—No person shall be entitled to the privileges of active membership until he shall have signed the Constitution and paid the initiation fees and dues. If he omit the same for one year his election shall be void.

Sec. 3.—No person having once been a member of this Society who has forfeited his membership by the nonpayment of his dues, shall be eligible to reëlection until the amount due from him at the time he was dropped be paid.

The names of all candidates recommended by the Board of Examiners for active membership shall be posted conspicuously in the room where the Society meets, and shall not be voted on until the daily session of the Council next following the posting.

Any member of the Society knowing of any reason why a candidate for membership should be rejected, shall notify the Board of Examiners and the Council through its presiding officer, in writing of such reasons.

Any candidate for membership who has once been voted upon and rejected, shall not have his name proposed again until the next annual meeting.

Corresponding and Honorary Members—How Elected.

Sec. 4.—The names of candidates for Corresponding or Honorary membership shall be presented to the Board of Examiners only upon the recommendation of ten active members.

The Board shall recommend them for election only after satisfying themselves that they have the qualifications provided for in Secs. 3 and 4, Article VIII.

of the Constitution ; and such names shall upon no occasion be presented to the Council, except by the Board of Examiners, who shall, in reporting names for Corresponding or Honorary membership, state what work the candidates have done entitling them to be so presented.

If any Corresponding member shall enter upon the practice of dentistry in this State, his corresponding membership shall thereupon cease.

Active Members Removing from the State.

Sec 5.—Active members removed from the State may retain their membership by notifying the Secretary of their desire to be placed upon a list of non-resident members, and by regularly paying an annual fee of one dollar. Those having lost their membership by removal, if still in reputable practice, may be elected non-resident members.

ARTICLE VIII.

Initiation Fee and Annual Dues.

Section 1.—The initiation fee shall be five dollars. The annual dues shall be five dollars, payable in advance, on the morning of the first day's session of the annual meeting. No member shall be entitled to the privileges of the floor until his dues are paid. Any member who neglects to pay his annual dues two successive years, shall cease to be a member without action of the Society, *provided* the Secretary has notified him of his indebtedness.

What Members are or may be Exempt from Dues.

Corresponding and Honorary members shall be exempt from the payment of all dues ; and as a mark of honor for distinguished services in the profession, by special action of the Society, the dues of an active member may be remitted. An active member having paid annual dues for twenty-five consecutive years, shall be constituted a life member, and shall be exempt from payment of dues.

ARTICLE IX.

Duties and Privileges of Members.

Section 1.—An active member shall not accept a student for a less period than three years, and shall require each student to give a written obligation to graduate at some regularly organized dental college before he assumes the responsibilities of a dental practitioner.

Sec. 2.—Active members shall be entitled to debate and vote on all questions discussed in the Society, and eligible to any office in its gift, provided their dues are fully paid.

Sec. 3.--Corresponding and Honorary members shall be entitled to a seat in meetings of the Society, and have the privilege of debating all questions of a professional or scientific character.

ARTICLE X.

Resignation or Expulsion of Members.

Section 1.—Any member shall have leave to resign (except in cases of impeachment), upon application made therefor in writing ; *provided* all arrears due from him to the Society have been discharged.

SEC. 2.—Any member may be impeached by three members, for violating the laws of this Society, for malpractice, or other gross misconduct. All charges shall be made in writing with specifications, clearly setting forth each violation of the code of ethics governing this body. The member so impeached shall have transmitted to him a written copy of the impeachment, with notice of the time of hearing, before a committee of five members appointed for that purpose; then if the report of said committee sustain such impeachment, the Council, at the next regular meeting, may, by ballot, suspend or expel such member, by a majority of three-fourths of all the votes cast.

COMMITTEE ON ETHICS.

SEC. 3.—There shall be appointed annually, by the Executive Council, a Committee on Ethics, to consist of three members, to whom all complaints shall be submitted, and through whom alone shall cases of infractions of the code be brought before the Council.

ARTICLE XI.

No member shall speak on any question unless his dues are paid, and until his name has been announced by the presiding officer, nor shall any one speak more than twice upon one subject, nor to exceed fifteen minutes in all, unless by affirmative vote of the Society.

ARTICLE XII.

ANNUAL MEETINGS.

SECTION 1.—The annual meeting shall be held in May, commencing on the second Tuesday at 10 o'clock A. M., and shall be devoted to the reading and discussion of papers and such other business as shall relate to the interests of the profession, concluding with the election of officers during the last daily session. Ten active members shall be necessary to constitute a quorum for the transaction of business at any meeting of this Society.

The Executive Council shall meet at 9 o'clock A. M., preceding the meeting of the Society, and shall hold a session before each daily session of the Society if necessary. They may be called together at any time during the year by the President, upon the request of three members of the Council.

SEC. 2.—None but members of this Society shall be present during elections; *provided* an active member of the Society calls for the enforcement of this section.

SEC. 3.—It shall be the duty of the Society at each regular meeting, to appoint one of its members to deliver an address at the next regular meeting.

ARTICLE XIII.

ALTERATIONS OR AMENDMENTS.

SECTION 1.—These By-Laws may be altered or amended at any regular meeting by a vote of two-thirds of the members of the Society present, *provided* said alteration or amendment shall have been presented at a previous meeting.

If the purpose and scope of such alterations or amendments be announced in writing at the annual meeting, or, if a general revision is desired to be made, and

the society, or its executive council, shall appoint a committee to determine the details of such amendments, or to make such revision, the publication in the "Transactions" of such changes as are proposed to be made, or of such revised By-Laws, shall be deemed a sufficient compliance with the requirements of this section, and such proposed alterations, amendments, or revision, may be adopted or rejected at the next annual meeting thereafter.

ARTICLE XIV.

Rules of Order.

Robert's Rules of Order shall be the Code of this Society.

ARTICLE XV.

This Constitution shall go into effect immediately upon its adoption, and it shall be the duty of the presiding officer at once to appoint a Nominating Committee, as provided in Article II. of the By-Laws, and said committee shall as soon thereafter as possible present the names of the Executive Council, and the vote be then immediately taken.

STANDING RESOLUTIONS.

Supervisor of Clinics.

Resolved, That a Supervisor of Clinics shall be appointed annually by the Executive Council to serve one year.

The duties of such Supervisor shall be to make all arrangements for the holding of clinics, to have charge of the clinic rooms, fixtures, etc., and to determine who may or may not operate, what operations shall be performed, etc., etc. He shall keep a record of all operations in a book provided for that purpose, and shall report to the Society annually at the second daily session after the holding of the clinics.

His report shall contain as thorough a criticism of each operation as possible, setting forth all the steps he may have deemed incorrect or otherwise, a statement of what he would have thought a better method, and his reasons therefor—to the end that profitable and instructive discussion may follow. He shall also report, as far as possible, the condition of operations made at the clinics of previous years.

He may appoint one or more assistants, as may be required.

He shall notify each clinical operator to supply himself with all needed instruments and appliances for the proper performance of his operations, and request him to select for himself an assistant.

Alternates shall also be selected and notified.

Duties of Librarian.

Resolved, That after this date (May 1885), it shall be the duty of the Librarian to obtain cabinet photographs, so far as possible, of all the members of this Society deceased, and likewise of the present members, and to properly arrange the

same in suitable albums to be procured by him; and the photographs of future members shall be added to the collection.

The Librarian shall be the custodian of these albums, and shall bring them to each annual meeting for the inspection of the members.

Resolved, That the following Committees be created :

COMMITTEE ON DENTAL SCIENCE AND LITERATURE.

First, a Committee consisting of one member on Dental Science and Literature, whose duty it shall be to report annually, on the first day of the annual meeting, on the progress of science and literature as appertaining to dentistry and give a resumé of all that may be new and important.

COMMITTEE ON DENTAL ART AND INVENTION.

Second, a Committee consisting of one member on Dental Art and Invention, whose duty shall be to report on the first day of each annual meeting, the advance made during the year in the arts and inventions appertaining to dentistry. This Committee shall exhibit the new devices and methods pertaining to the practice of dentistry, which are brought before the Society, in a room specially provided for that purpose.

The member of this committee shall be selected with reference to his special fitness for those duties, and be appointed by the Council.

The term of office shall be one year.

DISTRIBUTION OF TRANSACTIONS.

Resolved, That the official transactions shall not be supplied to members in arrears for annual dues ; but it shall be the duty of the Secretary to notify all delinquents of this action previous to the publication of the transactions.

Resolved, That the members of the Publication Committee shall have the power to make such arrangements as in their judgment they deem proper looking toward the publication of the transactions for the succeeding year.

CODE OF ETHICS.

ARTICLE I.

SECTION 1. The dentist should be ever ready to respond to the reasonable wants of his patrons, and should fully recognize the obligations involved in his duties toward them. As, in many cases, they are unable to comprehend the operation or service performed, or to correctly estimate its value, the practitioner must be guided by his own sense of right, in treating the case as his superior knowledge dictates. His manner should be gentle and sympathetic, and yet sufficiently firm to enable him to secure the best results of his skill. He should gain the confidence of his patrons, not alone by the skillful performance of difficult operations, but also by attending carefully and conscientiously to the simpler cases committed to his care.

SEC. 2. The dentist, without being obtrusive or pedantic, should impart such information to his patrons as his opportunities afford him in regard to the causes and nature of the disease in the teeth, or adjacent parts, which he may be called upon to treat; and should explain to them the importance of availing them-

selves of such timely preventives or remedies as he may deem necessary to their welfare. He should also communicate such general information as shall enable them to exercise an intelligent appreciation of what the profession aims to accomplish.

SEC. 3. The dentist shall be temperate in all things, keeping both mind and body in the best possible health, that his patients may have the benefit of that clearness of judgment and skill which they have a right to expect.

ARTICLE II.

SECTION 1. Every member of the dental profession is bound, as such, to maintain the honor and integrity of the profession. To this end, he should himself be upright and courteous in his intercourse with the public and his brethren in the profession.

SEC. 2. It is unprofessional to resort to public advertisements, such as cards, handbills, posters or signs calling attention to peculiar styles of work, prices for services, special modes of operating, or to claim superiority over neighboring practitioners; to publish reports of cases, or certificates in the public prints; to go from house to house soliciting or performing operations; to circulate or recommend nostrums, or to perform any other similar acts. But nothing in this section shall be so construed as to imply that it is unprofessional for dentists to announce in the public prints, or by card, simply their names, occupation, and place of business; or in the same manner to announce their removal, absence from, or return to business; or to issue, to their patients appointment cards, with a fee bill for professional services thereon.

SEC. 3. The dentist, when applied to, for merely advice or temporary relief, by the patient of a reputable practitioner, whose services at that time he is unable to procure, should guard against disparaging the family dentist by hints, inquiries, or any other means calculated to weaken the patient's confidence in him. At the same time the dentist should not, from too high a sense of professional courtesy to his neighboring practitioner, allow the interests of persons so applying for counsel or service, to be jeopardized.

SEC. 4 And it shall be regarded as unprofessional to warrant operations or work as an inducement to patronage.

ACTIVE MEMBERS, 1897.

NAME.	ADDRESS.	ELECTED.
ADAMS, W. J.*	Knoxville	1897
AIGLEY, J. E.*	Farmington	1897
ALLEN, E. H.*	Freeport	1883
AMES, W. V-B.*	34 Washington St., Chicago	1884
ANTES, R. H * *Life Member*	Geneseo	1873
BAKER, HESTER, J.*	Quincy	1894
BANES, J. D.	70 State St., Chicago	1891
BARCUS, J. M.	Carlinville	1889
BARNETT, H. K.*	Upper Alton	1896
BECKWITH, T. W.	Sterling	1881
BENTLEY, C. E.	100 State St., Chicago	1895
BLACK, G. V., *Life Member*	Jacksonville	1868
BLAIR, E. K.*	Waverly	1887
BRIGHAM, E. T.*	Watseka	1889
BROADBENT, T. A.	31 Washington St., Chicago	1895
BROPHY, T. W.*	126 State St., Chicago	1876
BROWN, A E.	1911 Michigan Ave., Chicago	1882
BROWN, J. B.*	Bloomington	1892
BROWN, J. ROY	Quincy	1895
BRUNSON, G. M.*	Joliet	1897
BULL, H. B.*	Fairbury	1892
CAMPBELL, J.*	Bloomington	1875
CAMPBELL, S A.*	Mattoon	1886
CAREY, G B.*	Perry	1897
CARPENTER, E. R.*	18 Van Buren St., Chicago	1895
CARPENTER, GEO. T.	103 State St., Chicago	1897
CASE, C. S.*	126 State St., Chicago	1894
CATTELL, D. M.	92 State St., Chicago	1889
CHAPMAN, W. C.*	Gibson City	1895
CHENOWETH, A. W.*	Atlanta	1897
CIGRAND, B. J	475 West North Ave., Chicago	1893
CIGRAND. P. J	718 South Halsted St., Chicago	1896
CLARK, A. B.	34 Washington St., Chicago	1876
CLUSMANN, L.*	360 Blue Island Ave., Chicago	1892
COLHAMER, CHAS. E.*	Peoria	1897
COLLINS, J. W.*	Lincoln	1883
CONKEY, F. M.*	Homer	1895
COOK, GEO. W.	47th and Kenwood Ave., Chicago	1894

*Present.

Name.	Address.	Elected.
Corbett, C. C.*	Edwardsville	1892
Cormany, J. W.	Mt. Carroll	1878
Corwin, J.	737 Madison St., Chicago	1895
Coulson, D. E.*	Galesburg	1890
Crawford, S. W.*	108 Washington Ave., Chicago	1897
Crissman, Ira B.*	92 State St., Chicago	1890
Crouse. J. N., *Life Member*	2231 Prairie Ave., Chicago	1865
Cummins, J. T.*	Metropolis City	1888
Curry, J. A.*	Streator	1892
Curtis, W. W.*	34 Washington St., Chicago	1897
Cushing, G. H.* *Life Member*	31 Washington St., Chicago	1865
David, E. B.* *Life Member*	Aledo	1873
David, G. L.	Aledo	1896
Davis, J. A. W.* *Life Member*	Galesburg	1872
Davis, K. B., *Life Member*	Springfield	1869
Davis, L. L.*	103 State St., Chicago	1885
Dayan, L. F.	Masonic Temple, Chicago	1885
Daymude, O. M.*	Monmouth	1893
Dennis, G. J.*	257 31st St., Chicago	1890
Devlin, J. B.*	2204 Michigan Ave., Chicago	1897
Dillon, E. H.*	Elmwood	1897
Dillon, G. B.*	Sterling	1886
Dorn, C. P.	Naperville	1880
Duncan, E*	Jacksonville	1877
Duncan, S F.*	Joliet	1881
Dunn, J. Austin*	31 Washington St., Chicago	1887
Eiles, F. Stanley*	Blue Island	1893
Entsminger, G. W.	Carbondale	1888
Evey, D. H.	Monmouth	1894
Fischer, Vincent	570 Blue Island Ave., Chicago	1892
Fishburn, J. M.	El Paso	1884
Frazee, O. L.*	Springfield	1897
Freeman, A. B.	580 West Madison St., Chicago	1889
Freeman, A. W., *Life Member*	34 Washington St., Chicago	1865
Freeman, D. B., *Life Member*	92 State St., Chicago	1872
Freeman, I. A.	100 State St., Chicago	1885
Gallie, Don M.	100 State St., Chicago	1894
Gardiner, F. H.	31 Washington St., Chicago	1877
Gilmer, A. L.	Quincy	1895
Gilmer, Thos. L * *Life Member*	126 State St., Chicago	1872
Gluesing. J. W.*	Moline	1893
Goebel, Robert*	Lincoln	1884
Gordon, Byron	Moline	1893
Goslee, H. J.*	Madison St. and Ogden Ave., Chicago	1897
Green, W. F.	South Evanston	1892

*Present.

Name.	Address.	Elected.
Griffin, E. B.*	East St. Louis	1897
Guffin, E. L., *Life Member* (*vote* 1889).	Geneseo	1882
Gunther, H. Alfred*	3300 Cottage Grove Ave., Chicago	1892
Hancock, J. E.*	126 State St., Chicago	1897
Hanaford, M. L.	Rockford	1878
Harlan, A. W.* *Life Member*	Masonic Temple, Chicago	1872
Harper, W. E.*	3456 Wabash Ave., Chicago	1893
Harris, A. J.	279 Warren Ave., Chicago	1886
Hebert, A. W.	31 Washington St., Chicago	1894
Henderson, G. H.	Springfield	1896
Henderson, L. D.	Evanston	1896
Henry, T. F.*	Streator	1896
Herbert, Frank Y.*	Ottawa	1897
Hewes, C. T.	Quincy	1896
Hinkins, J. E.*	131 53d St., Chicago	1888
Hodgman, C. W.*	Princeton	1897
Holland, W. E.*	Jerseyville	1889
Honsinger, E., *Life Member*	318 Park Ave., Chicago	1865
Hoover, W. A.*	Gibson City	1897
Houston, J. T.*	Peoria	1897
Howe, A. O.	70 State St., Chicago	1891
Hunter, H. L.*	Clinton	1892
James, Austin F.	Oak Park	1895
James, P. R.*	Ottawa	1897
Johnson, C. N.*	31 Washington St., Chicago	1886
Johnston, W. A.*	Peoria	1891
Kane, J. K.	Pinckneyville	1896
Kasbeer, J. W.*	Normal	1897
Keefe, J. E.*	34 Washington St., Chicago	1888
Kester, P. J.*	126 State St., Chicago	1882
Kitchen, C. A., *Life Member*	Rockford	1865
Koch, C. R. E.* *Life Member*	213 31st St., Chicago	1867
Lakin, S. W.*	Eureka	1895
Lamereaux, J. M.*	Galesburg	1895
Lawrance, R. N.*	Lincoln	1879
Leake, C. W.	2454 Indiana Ave., Chicago	1894
Lickly, J. J.*	Morris	1897
Lowry, F. M.*	Delavan	1897
Lumpkin, I. A.	Mattoon	1886
Mabee, W. E.*	Galesburg	1895
Magill, W. T.* *Life Member*	Rock Island	1871
Magnisson, J. E.*	Orion	1897
Maguire, J. K.*	Lewistown	1897
Mariner, J. Frank, *Life Member*	31 Washington St, Chicago	1872
Marshall, J. S.	34 Washington St, Chicago	1883

*Present.

Name.	Address.	Elected.
Martin, W. C.	Peoria	1881
Matteson, A. E. *Life Member*	3700 Cottage Grove Ave., Chicago	1869
Matteson, C. F., *Life Member*	50 35th St., Chicago	1872
Matthews, J. H.	Galesburg	1895
Meerhoff, C. E.	1603 N. Clark St., Chicago	1891
Merriman, Chas J.	92 State St., Chicago	1891
Moorhead, W. W.	Aledo	1895
Munroe, Grafton*	Springfield	1890
McCandless, A. H.*	126 State St.	1892
McCandless, A. W.*	126 State St., Chicago	1892
McDaniel, J. A *	Princeton	1897
McDonough, Martin L.*	Winchester	1897
McIntosh, F. H.*	Bloomington	1884
McLean, F. R.*	Danville	1897
McMillan, H. W.*	Roseville	1897
McMillen, Geo. A.*	Alton	1891
McMillen, J. D.*	Macomb	1897
Newkirk, Garret1*	31 Washington St., Chicago	1880
Newsome, B.*	Minonk	1894
Noyes, Edmund,* *Life Member*	92 State St., Chicago	1872
Noyes, F. B.	92 State St., Chicago	1895
Nyman, J. E.*	34 Washington St., Chicago	1894
Oakey, A. J.	63d St. and Stewart Ave., Chicago	1892
Ormsbee, W. W., *Life Member*	Geneva	1865
Ottofy, Louis.*	Masonic Temple, Chicago	1881
Overholser, W. A.*	Milledgeville	1897
Patterson, F. J.	Mendota	1896
Pearce, R. M.*	Rock Island	1891
Peck, A. H.*	92 State St., Chicago	1890
Peters, C. F.*	Peoria	1897
Peters, E. H.*	Peoria	1897
Pfeifer, Josephine D.*	Masonic Temple, Chicago	1894
Porter, C. A.*	Eureka	1897
Potter, Samuel H.*	Dwight	1897
Potts, H. A.*	Bloomington	1897
Powell, C. B.*	Jacksonville	1894
Pritchett, T. W.*	White Hall	1877
Priestman, W. H.	Pontiac	1883
Primrose, F.	Springfield	1892
Prothero, J. H.	146 Franklin St., Chicago	1896
Pruyn, C. P.*	100 State St., Chicago	1876
Rayburn, J. R.*	Fairbury	1890
Reed, J. J.	Rockford	1896
Reid, J. G.*	126 State St., Chicago	1882
Reid, J. H.*	Bloomington	1897

*Present.

Name.	Address.	Elected.
Robbins, E. M.*	Carthage	1882
Roberts, Benj. J	516 Lincoln Ave., Chicago	1890
Roberts, N. J	Waukegan	1886
Rohland, C. B.*	Alton	1874
Royce, E. A	721 Washington Boul., Chicago	1886
Rue, A. W.*	Alton	1897
Salomon, G. S	Masonic Temple, Chicago	1885
Salter, G. B., *Life Member*	31 Washington St., Chicago	1871
Sawyer, C. B *	Jacksonville	1887
Schuhmann, H. H	103 State St., Chicago	1892
Shedd, J. W.*	Pontiac	1897
Sitherwood, G. D.*	Bloomington	1880
Skidmore L. W.*	Moline	1891
Smith, Ahthur G.*	Peoria	1896
Smith, Geo. E.*	Byron	1897
Sprinkle, J. M	Nokomis	1893
Stafford, F. H	490 W. Madison St., Chicago	1896
Staley, H. Reid	Lanark	1894
Stevens, W. A.*	2361 Wabash Ave., Chicago	1876
Stewart, E. H	Joliet	1890
Stewart, L. K.*	103 State St., Chicago	1897
Stone, E. C.* *Life Member*	Galesburg	1866
Swain, Edgar D.* *Life Member*	92 State St., Chicago	1867
Taggart, W. H.*	Masonic Temple, Chicago	1880
Taylor, C. R.*	Streator	1880
Thayer, C. H	3302 Indiana Ave., Chicago	1885
Thomas, Geo. A.*	126 State St., Chicago	1897
Thompson, C. N	5017 Michigan Ave., Chicago	1894
Thompson, Florence E.*	Dwight	1896
Tibbets, C. J	Quincy	1882
Tobey, W. W.*	Danville	1889
Trompen, C. N	Roseland	1892
Tuller, R. B	877 W. Monroe St., Chicago	1892
Waltz, A. S.*	Decatur	1877
Warren, G. E*	Pontiac	1895
Wassall, J. W.*	92 State St., Chicago	1882
Watson, A.*	Galesburg	1896
Webb, G. D.*	Wilmington	1896
Wellman, H. W.*	Quincy	1896
West, C. H	Farina	1892
Whipple, Henry L	Quincy	1896
Widenham, J. C.*	Jacksonville	1874
Wikoff, B. D.*	Masonic Temple, Chicago	1888
Williams, L. M.*	144 Oakwood Boul'd, Chicago	1897
Wilson, Orville W.*	Carrollton	1897

*Present.

NAME.	ADDRESS.	ELECTED.
WOLF, H. M	Kewanee	1895
WONDERLY, T. G.*	Galena	1881
WOOLLEY, J. H	100 State St., Chicago	1877
YORK, E. LAWLEY*	126 State St., Chicago	1897
YORKER, F. V	48 43d St., Chicago	1892

Total, 223. Number present 138.

NONRESIDENT MEMBERS.

CHRISTMANN, GEO. A	Cliff House, Manitou, Col.†	1881
KRAUS MAURICE	1 Singer Strasse 10, Vienna, Austria	1895
LECRON, D. O. M	Union Trust Building, St. Louis, Mo.	1892
TIMERMAN, E. C	1169 Broadway, Oakland, Cal	1896
WARNER, E. R.*	California Bldg., Denver, Col	1882

Total, 5. Number present, 1.

CORRESPONDING MEMBERS.

ANDERSON, ELI W	15½ E. Washington St., Indianapolis, Ind.	1887
BALDWIN, C. V	Los Angeles, Cal	1885
BARRETT, W. C.	208 Franklin St., Buffalo, N. Y	1881
BOWMAN, G. A	2602 Locust St., St. Louis, Mo	1881
BRONSON, Geo. A	3201 Washington Ave., St. Louis, Mo	1881
COCHRAN, R. L	Burlington, Iowa	1885
CUNNINGHAM, GEO	2 King's Parade, Cambridge, England	1888
CUSTER, LEVITT E.*	Dayton, Ohio	1896
DEAN, F. W	Des Moines, Iowa	1884
FRENCH, D. GALE	Pittsburg, Pa	1881
FULLER, A. H	Columbia Building, St. Louis. Mo	1880
GREVERS, J. E	13 Oude Turf Markt, Amsterdam, Holland	1888
HARPER, JOHN G	800 Pine St., St. Louis Mo	1892
HUGHES, E. E	Des Moines, Iowa	1885
HURTT, J. M	Pomona, Cal	1890
KENNERLY, J. H.*	Grand and Franklin Aves, St. Louis, Mo	1897
LEVETT, M. M	10 Boul. des Capucines, Paris, France	1888
MOODY, J. D	Los Angeles, Cal	1894
MOODY, KATE C	Los Angeles, Cal	1894
MORRISON, JOHN B	9 When Block, Indianapolis, Ind	1882
PATRICK, GEO	Bolton, England	1890
REED, J. W	Butte City, Mont	1883

*Present.

†Chicago address, 507 LaSalle Avenue.

Name.	Address.	Elected.
Stutenroth, C. W.	Watertown, S. D.	1884
Sylvester, A. H.	2 Sommer Strasse, Berlin, Germany	1888
Templeton, J. G.*	Pittsburg, Pa	1881
Tomes, Charles S.	39 Cavendish Square, London, England	1888
VanMarter, J. G	Tacoma, Wash	1888
Walker J.	22 Grosvenor Street, London, England	1888

Total, 28. Number present, 3.

HONORARY MEMBERS.

Name.	Address.	Elected.
Brewer, F. A.	San Francisco, Cal.	1869
Butler, C. R.	Cleveland, Ohio	1874
Chase, H. S.	910 Olive Street, St. Louis, Mo.	1869
Chittenden, C. C.	Madison, Wis.	1872
Crowley, C. Geo	1358 Lexington Avenue, New York City	1885
Hardtner J.	Springfield, Ill.	1877
Miller, W. D	46 Voss Strasse, Berlin, Germany	1885
Morrison, James B.	1422 Baltimore Avenue, Kansas City, Mo.	1869
McKellops, H. J.	3548 Lindell Ave, St. Louis, Mo.	1868
Porre, R. J.	278 Race Street, Cincinnati, Ohio	1868
Rathbun, R. S.	Clinton, Iowa	1872
Taft, J.	Elm and Shillito Avenue, Cincinnati, O.	1874
Wilson, I. P.	Burlington, Iowa	1874

Total, 13. Number present, 0.

ROLL OF HONOR.

Specially Honored by the Society.

Black, G. V. 1889 Cushing, Geo. H.* 1889

RESUME.

	Total.	Present.
Active Members in Illinois, (except Chicago), *Life*, 10	135	95
Chicago, *Life*, 14	88	43
Nonresident Members	5	1
Corresponding Members	28	3
Honorary Members	13	0
*Present.	269	142

MINUTES

OF THE

ILLINOIS STATE DENTAL SOCIETY,

MEETING OF 1897.

FIRST DAY—TUESDAY, MAY 11—Morning Session.

The thirty-third annual meeting of the Illinois State Dental Society was called to order at 10:30 o'clock in the Masonic Temple, Peoria, by the President, Dr. C. R. Taylor, of Streator.

The roll call showed that forty-two members were present at the opening session.

Invocation by the Rev. Caspar Wistar Hiath.

President Taylor then introduced the Hon. John S. Stevens, of Peoria, who delivered the following

ADDRESS OF WELCOME.

Mr. President and Gentlemen of the Illinois State Dental Society :—It becomes my duty, and it is my pleasure to welcome you to this city and to extend to you the hospitalities of its citizens. We welcome you to a city beautiful for situation, and while we are not extravagant or sufficiently egotistical to claim it as the joy of the whole earth, it is the joy of those who reside within its limits, and we trust that during your brief sojourn here you may find it a joy to you. In times passed we have welcomed the representatives of other associations. We have recognized and welcomed ministerial associations and we have been glad to show them the beauties of our city. We have been glad to bring them in contact with our people and show them the representatives of the different cities of the great State of Illinois. We have taken pride in introducing and bringing them in contact with

the better class of our citizens; we have endeavored to make their sojourn here pleasant and attractive, so as to induce them when they return to their homes to speak well of this city and in the future return again. We have welcomed the medical profession from like philanthropic motives and we have kept them as long as we could. We knew they were unaquainted with us and that they would do us no harm, and we have kept them here out of pure philanthropy to their patients so that they might have at least a reasonable chance to recover during their absence. (Laughter.) We have welcomed other bodies of men, and now, to-day, gentlemen, we take pleasure in welcoming you, the representatives of an honorable, useful and valuable profession. You have done much to alleviate human suffering. I can hardly say, from my experience and knowledge of those with whom I have been brought in contact, that your philanthropy is purely gratuitous; but nevertheless it is a philanthropy all the same, and I trust you may enjoy yourselves during your stay here, and that this meeting will be one of profit and of pleasure to you, and in welcoming you again on behalf of the city and its citizens I hope that your sojourn may be of such a character that you will take back with you nothing but pleasant recollections from the city of Peoria. (Applause.)

The President called upon Dr. Garrett Newkirk to respond to the address of welcome on behalf of the Society.

Dr. Newkirk made the following

RESPONSE TO THE ADDRESS OF WELCOME.

During my membership in the State Society I have listened yearly to an address of welcome, usually by the Mayor of the city wherein we happen to meet, and I may say without flattery that during the seventeen years that I have been a member of this society I have never heard one more pleasant and appropriate, and I am sure we thank the Hon. Mr. Stevens for his cordial words of welcome to this beautiful city. As Mr. Stevens may know, we meet every two years in Springfield. The city of Springfield has the presence of the Legislature during one year, and the pleasure of our society the next, and it is hard to tell which the citizens enjoy the most. [Laughter.] During the alternate years we go first to one city and then another, Rock Island, Quincy, Galesburg, Decatur, Bloomington, and so forth, and we get around

to Peoria about once in ten years. Whenever we come to Peoria we all appreciate its beauties more and more, finding always that improvements have been made during the period of our absence, so that we have come to look upon this city as one of the most pleasantly situated and finest of the State. However, in allusions to Peoria, I think I never heard a speech made in which one was not made to ascertain industry that is supposed to be peculiar to this city, but I am glad that allusion has not been made to-day. I do not see why the rules of good society in our ordinary intercourse with people cannot be observed on occasions like this. If we meet a man on the street, or socially, we do not allude first to the wart on his nose and ask him how he got it, nor the squint of his eye, nor to the clubbed foot which he may happen to possess. That would not be in good taste. So when I come to Peoria I prefer to think of the beautiful and noble things. I prefer to look back over the history of this great city, to think of its growth within fifty years from a mere hamlet to its present dimensions. I prefer to think of the grand men and noble women who have made this city what it is industrially, socially and commercially, of the men who have built these magnificent buildings and paved these streets along the valley and out over the bluffs and hills, with trees along their borders, with flowers in the yards on either hand and vines climbing over the porches; where we may see in imagination everywhere repeated those beautiful words, "This is a Home;" and where every morning children go forth to school with a mother's kiss upon their forehead. I prefer to think, Mr. Stevens, of your wonderful school system which is educating the children of your city. I prefer to think of the noble women who have organized here a Literary Club which is known all over the United States, who have made a magnificent building which they own and control—a building which demonstrates their progressiveness, their intelligence and executive ability. I prefer to think of all these things and of the churches with their spires pointing heavenward, to things infinitely higher and nobler than some of those elements of which we hear so much and ought to hear less. Mr. Stevens, on behalf of the State Dental Society, I thank you most cordially for your words of welcome. (Applause.)

The Vice President, Dr. E. B. David, of Aledo, then took the chair and President Taylor delivered the annual address.

The discussion was opened by Dr. C. N. Johnson, and continued by Drs. D. E. Coulson, Arthur G. Smith, T. F. Henry, S. F. Duncan, Louis Ottofy, Edmund Noyes, C. B. Rohland, Geo. A. McMillen, Garrett Newkirk, Geo. H. Cushing, J. G. Reid, E. H. Allen, J. W. Wassall, Grafton Munroe, and closed by Dr. Taylor.

On motion, the subject was passed.

Dr. Wassall moved that a committee be appointed to consider the advisability of presenting to Dr. Black a suitable medal in recognition of his services to the dental profession and also to offer prizes for original scientific work by members of the society.

Seconded and carried.

On motion, adjourned.

Afternoon Session.

The meeting was called to order at 2:15 P. M., by the President, Dr. Taylor.

The minutes of the previous session were read and approved.

The report of the committee on "Dental Science and Literature" was then read by Dr. A. W. Harlan, of Chicago.

The report was discussed by Dr. Geo. H. Cushing, and on motion, passed.

The report of the committee on "Dental Art and Invention" was then read by Dr. J. E. Keefe, of Chicago.

The discussion of the report was on motion postponed until a supplementary report will be presented by this committee.

After a recess of ten minutes, taken for the purpose of inspecting the new inventions presented by this committee, Dr. J. W. Wassall, of Chicago, read a paper on "Pyorrhœa Alveolaris."

The discussion was opened by Dr. A. W. Harlan, of Chicago, and continued by Drs. R. N. Lawrance, T. L. Gilmer, J. E.

Keefe, J. G. Reid, Grafton Munroe, Garrett Newkirk, F. H. McIntosh, J. G. Templeton, of Pittsburg, Pa., and closed by J. W. Wassall.

A paper entitled " Opinions of the Illinois Dentists Regarding Dental Societies " was then read by Dr. E. H. Allen, of Freeport.

The discussion was opened by Dr. Geo. H. Cushing and continued by Drs. J. G. Reid, T. W. Pritchett, Louis Ottofy, C. B. Rohland, J. A. W. Davis, Edmund Noyes, C. R. Taylor, and closed by E. H. Allen.

The President announced the appointment of Drs. J. W. Wassall, of Chicago, D. E. Coulson, of Galesburg, and Grafton Munroe, of Springfield, as a committee to consider the advisability of presenting a medal to Dr. Black and the offer of prizes for original scientific work.

On motion, adjourned.

Evening Session.

The meeting was called to order at 8:30 P. M. by the President, Dr. Taylor.

The minutes of the previous session were read and approved.

A paper entitled Classification of Cavities and Rules Governing their Preparation," was then read by Dr. W. E. Harper, of Chicago.

The discussion was opened by Dr. C. B. Rohland, of Alton, and continued by Drs. C. N. Johnson, J. A. W. Davis, Edmund Noyes, E. H. Allen, J. E. Nyman, Geo. E. Hunt, of Indianapolis, Ind., J. G. Templeton, of Pittsburg, Pa., Thos. L. Gilmer, A. H. Peck, J. G. Reid, I. B. Crissman, E. K. Blair, Garrett Newkirk, R. N. Lawrance, and closed by the essayist, Dr. Harper.

On motion, adjourned.

SECOND DAY—WEDNESDAY, MAY 12.

The forenoon was devoted to clinics. See the report of the Supervisor of Clinics.

Afternoon Session.

The meeting was called to order at 2:30 P. M. by the President, Dr. Taylor.

The minutes of the previous session were read and approved.

A paper entitled "The Diffusibility of Coagulants in Dentine," was then read by Dr. E. Lawley York, of Chicago.

The discussion was opened by Dr. J. E. Hinkins, of Chicago, and continued by Drs. A. W. Harlan, J. G. Reid, A. H. Peck, J. W. Wassall, H. S. Lowry, of Kansas City, Mo., T. W. Brophy, C. N. Johnson, J. G. Templeton, of Pittsburg, Pa., W. A. Stevens, J. E. Nyman, G. D. Sitherwood, Garrett Newkirk, and closed by the essayist, Dr. York.

Dr. Blair moved that Dr. Peck be requested to present the results of his experiments on the various essential oils and other agents as ordinarily used in dental practice, as in Dr. Blair's judgment the record of this meeting would not be complete without them, it having been incidentally referred to in the discussion.

Seconded and carried.

On motion, adjourned.

Evening Session.

The meeting was called to order at 8:30 by Dr. Taylor, President.

The minutes of the previous session were read and approved.

Dr. C. R. E. Koch, Chairman of the Committee on Dental Legislation, appointed at the last annual meeting, then made a report regarding the work of the committee.

Dr. Stevens moved the acceptance of the report, and the reference of such matters as should be considered by the Executive Council to that body, with power to take such action as may be deemed necessary.

The question was discussed by Dr. Brophy.

On a point of order being raised, the previous question was put and carried.

The following paper was then read: "How Shall We Best Insert a Gold Filling?" By Dr. Arthur G. Smith, of Peoria. The discussion was opened by Dr. C. N. Johnson.

Dr. Cushing then presented the matter of the importance of membership in the Dental Protective Association, and was followed by Drs. E. B. David and J. E. Hinkins.

Dr. L. W. Skidmore, of Moline, then read a paper on "Anchoring Large Contour Fillings in Incisors." The discussion was opened by Dr. R. M. Pearce, of Rock Island, and then the discussion of both papers (Drs. Smith's and Skidmore's) was continued by Drs. J. E. Nyman, Edmund Noyes, W. H. Taggart, and Garrett Newkirk and closed by the essayists, Drs. Smith and Skidmore.

On motion, the subject was passed.

The Secretary was instructed to send to Dr. Cormany a telegram expressing the regrets of the society that he was prevented from being present on account of illness in his family.

On motion, adjourned.

THIRD DAY—THURSDAY, MAY 13.

The forenoon was devoted to clinics. See the report of the Supervisor of Clinics.

AFTERNOON SESSION.

The meeting was called to order at 2 P. M. by the President.

The minutes of the previous session were read and approved.

The resolution published in the minutes of the Executive Council appropriating $300.00 to the Dental Protective Association was read and on motion, adopted.

The report of the committee on medal and prizes was then read and the resolution regarding the matter offered by the Executive Council (see Council minutes) was on motion, adopted. The committee provided for in said resolution to be appointed by the Executive Council.

The following resolution, recommended by the Council, was, on motion, adopted.

PEORIA, ILL., May 13, 1897.

Whereas: It has come to the knowledge of this society that an enactment of a law for the appointment of dental surgeons in the army and navy of the United States, is to be introduced in the regular session of congress, to convene in December next, therefore be it

Resolved, That we, the dentists of Illinois, assembled in the city of Peoria in our thirty-third annual convention, hereby heartily approve of such an enactment, and be it further

Resolved, That the services of competent practitioners of our specialty, furnished by our government to our nation's defenders, would be a step in the direction of the securement of their greater comfort and efficiency in the performance of their duties.

Resolved, That the secretary be instructed to send a copy of this resolution to the honorable Secretary of War, and members of the Senate, and to the House of Representatives, representing the State of Illinois in both branches of congress.

Unanimously adopted.

Those present of the forty members elected up to the present time were then introduced by the President.

The President announced that he appointed Drs. Brophy, Curry and Gilmer (Thos. L.) a committee to nominate members for the Executive Council.

Dr. Peck then read a table relating to experiments with essential oils and other agents.

Dr. C. S. Case, of Chicago, then read a paper entitled "The Principles of Force on the Movement of Teeth."

The discussion was opened by Dr. Garrett Newkirk, of Chicago, and continued by Drs. G. D. Sitherwood, Arthur G. Smith, G. M. Brunson, W. T. Magill, J. G. Reid, Edmund Noyes, A. H. Peck, J. D. McMillen, and the discussion was closed by the essayist, Dr. Case.

Dr. J. G. Templeton, of Pittsburg, Pa., then read a paper entitled "Practical Things in Dental Practice."

On motion, adjourned.

Evening Session.

The meeting was called to order at 8 P. M. by the President, Dr. Taylor.

The minutes of the previous session were read and approved.

The Committee on Necrology then reported on the deaths of Drs. J. W. Fisher, of Bloomington, John Hilton, of Freeport, and J. A. Swasey, of Chicago, all active members, W. N. Morrison, honorary member, and C. W. Spalding, corresponding member, and requested permission to furnish a complete report for the transactions, which was granted.

Remarks were made by Drs. R. N. Lawrance, of Lincoln, C. S. Case, of Chicago, T. W. Brophy, C. R. Taylor, F. H. McIntosh, E. H. Allen and Edmund Noyes.

The discussion on Dr. Templeton's paper was then taken up by Dr. Edmund Noyes, who was followed by Drs. S. Finley Duncan, G. D. Sitherwood, H. S. Lowry, of Kansas City, Mo., E. T. Brigham, Ira B. Crissman, and closed by the essayist, Dr. Templeton.

Dr. A. O. Hunt, of Chicago, then read a paper entitled "The Relations of the Teeth to the Face." The discussion was opened by Dr. Geo. E. Hunt, of Indianapolis, Ind., continued by Dr. C. S. Case, and closed by the essayist, Dr. A. O. Hunt.

Dr. J. E. Keefe, of Chicago, then read a supplementary report of the Committee on "Dental Art and Invention."

On motion, the subject was passed.

Dr. T. W. Pritchett, Supervisor of Clinics, then read his report.

On motion, adjourned.

FOURTH DAY, FRIDAY, MAY 14—Morning Session.

The meeting was called to order at 9:30 A. M. by the President, Dr. Taylor.

The minutes of the previous session were read and approved.

The delinquent list was then read.

The following officers were elected by the society:

President, J. A. W. Davis, of Galesburg, Vice President, W. A. Johnston, of Peoria.

The Nominating Committee reported that they recommend for three years the present incumbents, Drs. Geo, H. Cushing Chicago, A. S. Waltz, Decatur, and E. H. Allen, Freeport, for the Executive Council.

To fill the vacancy created by the resignation of Dr. Peck, they recommend Dr. J. G. Reid, of Chicago.

On motion, the nominations were confirmed.

One of the questions proposed by the American Dental Association was then taken up for discussion.

Question: To what extent and when are we justified in using cataphoresis? Is there danger of injuring the dental pulp or other tissues by its use?

The discussion was opened by Dr. W. V B. Ames, of Chicago, who was followed by Drs. S. F. Duncan, J. A. W. Davis, J. G. Reid, C. S. Case, Edmund Noyes, P. J. Kester, E. T. Brigham, G. M. Brunson, R. N. Lawrance. The discussion was closed by Dr. Ames, and the subject passed.

The retiring President then expressed his thanks to the Society for the uniform courtesy and good will of the members.

The President-elect was then escorted to the chair, and Dr. Taylor, the retiring President, presented him to the society in a few well chosen words.

On taking the chair, Dr. Davis in accepting the presidency, said:

Gentlemen of the Illinois State Dental Society:—It may be you expect a speech from me, but if you do, you will be sadly mistaken. As a speech-maker I am not in it. I want to say this, however, that I was very much surprised when I heard the result of the ballot this morning. If I had not gotten a single vote it would not have surprised me half as much. I do not know why you elected me to this position, as the only qualification I have for this place is perhaps my age. I am as old as any of you, with the exception of Dr. Cushing. I have been a member of this society for twenty-six years, have attended it for twenty-eight years, and have only missed three meetings. (Applause). I wish there were more here who could say the same thing, and I hope the young men that are now joining the society will make it a point to be as regular in their attendance as I have been. Another thing, I have been here as a rule the first day and have remained until the last. Gentlemen, I thank you for the distinguished honor you have conferred upon me.

The Vice President elect, Dr. W. A. Johnston, of Peoria, was then introduced to the society, and thanked the members for the honor conferred upon him.

The President appointed the following Publication Committee: Edmund Noyes and C. N. Johnson, who, with the Secretary constitute the committee.

During the four days' meeting the Secretary at various times announced the following as having been elected to membership:*

Adams, W. J., Knoxville.
Aigley, J. E., D. D. S., Farrington.
Brunson, G. M., M. D., D. D. S., Joliet.
Carey, G. B., Perry.
Carpenter, Geo. T., M. D , D. D. S., 103 State St., Chicago.
Chenoweth, A. W., Atlanta.
Colhamer, Chas. E., D. D. S., Peoria.
Crawford, S. W., D. D. S., 108 Washington St., Chicago.
Curtis, W. W., D. D. S., 34 Washington St , Chicago.

*Total number of active members elected at this meeting, 45, the largest in the history of the society. Best previous record, 1872, 30; 1892, 24.

Devlin, J. B , D. D. S., 2204 Michigan Ave., Chicago.
Dillon, E. H., D. D. S., Elmwood.
Frazee, O. L., D. D. S., Springfield.
Goslee, H. J., D. D. S., Madison and Ogden Ave., Chicago.
Griffin, J. B., D. D. S., East St. Louis.
Hancock, J. E., D. D. S., 126 State St., Chicago.
Herbert, Frank Y., D. D. S., Ottawa.
Hodgman, C. W., D. D. S., Princeton.
Hoover, W. A., D. D. S., Gibson City.
Houston, J. T., Peoria.
James, P. R., D. D. S., Ottawa.
Kasbeer, J. W., Normal.
Lickly, J. J., D. D. S., Morris.
Lowry, F. M., D. D. S., Delavan.
Magnisson, J. E., Orion.
Maguire, J. K., D. D. S., Lewistown.
McDaniel, J. A., Princeton.
McDonough, Martin L., Winchester.
McLean, F. R., D. D. S., Danville.
McMillan, H. W., D. D. S., Roseville.
McMillen, J. D., Macomb.
Overholser, W. A., D. D. S., Milledgeville.
Peters, C. F., Peoria.
Peters, E. H., Peoria.
Porter, C. A., Eureka.
Potter, Samuel H., D. D. S., Dwight.
Potts, H. A., D. D. S., Bloomington.
Reid, J. H., Bloomington.
Rue, A. W., D. M. D., Alton.
Shedd, J. W., Pontiac.
Smith, Geo. E., Byron.
Stewart, L. K., D. D. S., 103 State St., Chicago.
Thomas, Geo. A., D. D. S., 126 State St., Chicago.
Williams, L. M., D. D. S., 144 Oakwood Bd., Chicago.
Wilson, Orville W., D. D. S., Carrollton.
York, E. Lawley, D. D. S., 126 State St., Chicago.
For corresponding member:
Kennerly, J. H., D. D. S., Grand and Franklin Aves., St. Louis, Mo.

The minutes of the present session were read and approved.

On motion, the Society adjourned to meet at Springfield, Tuesday, May 10, 1898.

LOUIS OTTOFY, *Secretary.*

1897.

PROCEEDINGS

OF THE

EXECUTIVE COUNCIL,

ILLINOIS STATE DENTAL SOCIETY.

TUESDAY, MAY 11.—First Meeting.

The Executive Council met at 9:45 A. M., a quorum being present.

The report of the Secretary was then read and referred to the Auditing Committee.

SECRETARY'S REPORT.

Peoria, May 11, 1897.

Mr. President and Gentlemen:

Your Secretary presents the following annual report:

Total active membership at the beginning of last meeting	174
New members elected during last meeting	18
Reinstated	1
Total at close of meeting	193

There have been lost by resignation:

H. A. Costner.
Byron S. Palmer.
W. P. Richards.

By nonpayment of dues:

T. S. Childs, Decatur.
C. W. James, Oak Park.
J. J. Jennelle, Cairo.
S. T. Rice, Barry.
G. W. Thompson, Quincy.
A. S. Willis, Pana.

By death:
J. W. Fisher, Bloomington.
John Hilton, Freeport.
J. A. Swasey, Chicago.

By transfer to nonresident list:
Geo. A. Christmann
D. O. M. Le Cron
Maurice Kraus.

Total..... 15

Leaving the present active membership..... 178
The number of nonresident members is..... 5
The number of corresponding members* was increased by the election of Dr. L. E. Custer, and decreased by the death of Drs. C. W. Spalding, E. Magiôt† and Thos. W. Reed‡ and the removal of Dr. A. O. Hunt into the State to..... 27
The number of honorary members is decreased by the deaths of Drs. W. N. Morrison and L. C. Ingersoll¶ from 15 to..... 13

Total active nonresident, corresponding and honorary members..... 223

The following is a list of moneys received since the last annual report:

Dues received at last meeting	$300 00
Dues received from last meeting to date	370 00
Dues from nonresident members	2 00
Copy of Transactions of 1896 to Dr. Shryock	1 00
	$673 00

For which the Treasurer's receipts are herewith submitted.

LOUIS OTTOFY, Secretary.

We, the Auditing Committee, have examined the annual report as presented by the Secretary, and find the same correct.

E. H. ALLEN,
A. H. PECK.
EDMUND NOYES,
} Auditing Committee.

A list of names of those in arrears for dues was then read.

On motion, action on these names was deferred until a subsequent meeting.

The Treasurer asked for and was granted further time to make his report.

*Corrected to November 30, 1897.
†Died May, 1897.
‡Died November 14, 1896.
¶Died May, 1897.

The report of the Publication Committee was then read and referred to the Auditing Committee.

REPORT OF THE PUBLICATION COMMITTEE.

PEORIA, May 11, 1897.

Mr. President and Gentlemen:

Your committee authorized the DENTAL REVIEW, H. D. Justi & Son, publishers, to publish such portions as they desired, in the DENTAL REVIEW, and in consideration therefor H. D. Justi & Son paid the expenses of printing for a consideration of $150 00.

The volume for 1896 appeared on October 28, last. There are about forty cloth bound and thirty paper covered copies on hand, after the usual distribution to members, colleges, dental societies, libraries, etc. Cost of postage, delivery, etc., is included in the accounts of the Secretary.

Respectfully submitted,

LOUIS OTTOFY, Chairman,
EDMUND NOYES,
A. W. HARLAN.
Publication Committee.

The President appointed the following Auditing Committee, Drs. Allen, Peck and Noyes, to whom the Treasurer was permitted to submit his report.

The President appointed the following Committee on Necrology: Drs. C. B. Rohland, of Alton, J. Campbell, of Bloomington, and C. N. Johnson, of Chicago.

On motion, the Treasurer was authorized to pay all properly authenticated bills.

The President and Secretary were authorized to grant delegates' certificates to those desiring to attend the meeting of the American Dental Association.

The following votes of thanks were, on motion, adopted:

Resolved: That the Illinois State Dental Society extends its thanks to the S. S. White Dental Manufacturing Co., C. L. Bingham, Manager, for printing and distributing the programs in so satisfactory a manner.

Resolved: That the Illinois State Dental Society extends its thanks to Mr. Charles L. Bingham for the presentation of the excellent phototypes of the late S. R. Bingham, which were bound as a frontispiece in the Transactions of 1896.

Resolved: That the Illinois State Dental Society extends its vote of thanks to the Local Committee of Arrangements, and the hotels of Peoria and the railroads of the State for the granting of reduced rates, and other courtesies.

The incoming President was appointed to deliver the next annual address.

On motion, it was decided to hold an evening session, commencing at 8 P. M. to-day.

On motion, adjourned.

SECOND MEETING.

The council met at 12:30 P. M., a quorum being present.

The minutes of the previous meeting were read and approved.

The Treasurer then read his annual report, which was referred to the Auditing Committee.

TREASURER'S REPORT.

Edgar D. Swain, Treasurer, in account with the Illinois State Dental Society, 1896-97.

PEORIA, May 11, 1897.

1896.			
May 14,	Cash on hand		$ 65 92
May 16,	Received from the Secretary		176 10
May 16,	" " " "		125 90
1897			
May 6,	" " " "		120 00
May 11,	" " " "		251 00
			$738 92
1896.	Expended.		
May 14,	Order 143.	Secretary's salary and expenses of Exec. Com.	$125 90
June 22,	" 144.	Wm. Whitford. Stenographer	100 00
Aug. 17,	" 145.	Bingham Memorial	11 50
Dec. 26,	" 146.	H. D. Justi & Son. Publishing Transactions.	100 00
1897.			
May 6,	" 147.	Wagner Sons Co. Circulars for Dr. Allen	73 80
May 7,	Balance on Order No. 146		50 00
May 11,	Secretary. Postage on Transactions for 1896 and Secretary's expenses, May '96 to May '97		51 75
			$512 95
Balance in the treasury			$225 97

E. D. SWAIN, Treasurer.

We, the Auditing Committee, have examined the annual report as presented by the Treasurer, and find the same correct.

E. H. ALLEN,
A. H. PECK,
EDMUND NOYES. } Auditing Committee.

On motion, adjourned.

THIRD MEETING.

The Council met at 2 P. M., a quorum being present.

The minutes of the previous meeting were read and approved.

On motion, the usual salary of $100.00 was voted to be paid to the secretary.

On motion, adjourned.

FOURTH MEETING.

The Council met at 5:45 P. M., a quorum being present.

The minutes of the previous meeting were read and approved.

The auditing committee reported that it examined the reports of the secretary, treasurer and publication committee and found the same correct.

On motion, the report was adopted.

On motion, the Executive Committee was authorized to so change the program that Dr. Arthur G. Smith's paper, requiring a lantern, be read at the meeting to-morrow evening.

The following named persons were proposed for membership by the Board of Examiners: Charles E. Colhamer, D. D. S., Peoria; O. L. Frazee, D. D. S., Springfield; H. J. Goslee, D. D. S., Chicago; Samuel H. Potter, D. D. S., Dwight; George E. Smith, Byron; G. A. Thomas, D. D. S., Chicago; E. Lawley York, D. D. S., Chicago.

These names having been duly posted, were all voted upon and elected.

On motion, adjourned.

FIFTH MEETING.

The Council met at 11 P. M., a quorum being present.

The minutes of the previous meeting were read and approved.

The following named persons were proposed for membership

by the Board of Examiners: A. W. Rue, D. M. D., Alton; H. A. Potts, D. D. S., Bloomington; L. K. Stewart, D. D. S., Chicago; J. W. Kasbeer, Normal; W. A. Hoover, D. D. S., Gibson City; Martin L. McDonough, Winchester; E. H. Peters, Peoria.

These names having been duly posted were all voted upon and elected.

On motion, the paper of Dr. York was made a special order for Wednesday at 2 P. M.

On motion, adjourned.

WEDNESDAY, MAY 12—First Meeting.

The Council was called to order at 2 P. M., a quorum being present.

The minutes of the previous meeting were read and approved.

A communication relating to the appointment of dentists in the service of the army and navy of the United States from Dr. B. M. Ford, of Chicago, was then read, and, on motion, referred to Dr. E. D. Swain.

The report of the Committee on Prizes and a letter and telegram from Dr. Crouse relating to the Dental Protective Association was then read, and, on motion, postponed for action to a future meeting.

On motion, adjourned.

Second Meeting.

The Council was called to order at 5:15 P. M., a quorom being present.

The minutes of the previous meeting were read and approved.

On motion, Dr. Cushing was requested to present the subject of the Dental Protective Association before the Society.

The following named persons were proposed for membership by the Board of Examiners: J. B. Devlin, D. D. S., 2204 Michigan Ave., Chicago; S. W. Crawford, D. D. S., 108 Washington St., Chicago; W. W. Curtis, D. D. S., 34 Washington St., Chicago; J. J. Lickly, D. D. S., Morris; H. W. McMillan, D. D. S., Roseville; J. H. Reid, Bloomington; F. M. Lowry, D. D. S., Delavan; J. E. Hancock, D. D. S., 126 State St., Chicago; J. D. McMillen, Macomb; C. F. Peters, Peoria; C. A. Porter, Eureka; J. W. Shedd, Pontiac; G. B. Carey, Perry; P. R. James, D. D. S., Ottawa; J. R. Maguire, Lewistown; A. W. Chenoweth, Atlanta; J. T. Houston, Peoria; J. E. Magnisson, Orion; J. A. McDaniel, Princeton; Frank Y. Herbert, D. D. S., Ottawa; W. J. Adams, Knoxville; G. M. Brunson, M. D., D. D. S., Joliet.

These names having been duly posted were all voted upon and elected.

Dr. C. P. Pruyn then presented the regrets of Drs. J. H. Woolley, I. A. Freeman and Nels Nelson on account of their inability to be present. He also brought to the attention of the Council several cases of former members for reinstatement into membership.

On motion, adjourned.

THIRD MEETING.

The Council met at 7 P. M., a quorum being present.

On motion, Drs. Swain and Noyes were appointed to submit to the Council some proposition regarding the printing of the transactions for the coming year.

Dr. Cushing presented the following resolution:

WHEREAS, In view of the fact of the reception of the letter and telegram from Dr. Crouse. the Council upon due consideration have decided to recommend to the society that an appropriation of *three hundred* dollars be made to the Dental Protective Association, to assist it to pay its obligations. This action seems to the Council to be due the Protective Association in view of the fact that every member of this society has been saved, and will be saved, a larger amount of money annually through its protective agency, and it seems but just that we should recognize this fact through a donation as large as possible from our surplus funds.

Therefore be it Resolved, That this Society appropriate *three hundred* dollars to the Dental Protective Association.

[The resolution was read in blank, the amount was, subsequently, on motion, inserted.]

On motion, adopted.

The following report from the Committee on Medal and Prizes was then read:

PEORIA, May 12, '97.

TO THE ILLINOIS STATE DENTAL SOCIETY.

Gentlemen:

Your committee appointed to consider the advisability of presenting a gold medal to Dr. Black in recognition of his services in advancing the science of dentistry, and also to consider the advisability of offering prizes to members of this society for papers based upon original work, as suggested in the President's annual address respectfully begs leave to report.

We recommend an appropriation at this meeting of $100, to assist in defraying expenses of experiments or researches being made by Dr. Black.

We further recommend that a first prize of $100, and a second prize of $50, be offered for the two best papers based upon original work in some branch of dental science, such papers to be prepared by a member of this society and read before it.

That a prize committee be appointed by the Executive-Council, whose duty it shall be to judge as to the merits of competing papers and award the prizes. That said committee shall receive competing papers from the secretary of the society twenty days prior to the annual meeting and shall be kept in ignorance of the identity of competitors until after their decision is reached. That it shall be discretionary with the prize committee, whether any prize be awarded in case competing papers have insufficient merit. Respectfully submitted,

JOSEPH W. WASSALL,
GRAFTON MUNROE,
Committee.

Dr. Cushing presented the following resolution:

Resolved, the Council having fully considered the report of the Committee on Medal and Prizes, does not consider it advisable to recommend the adoption of this plan at the present time, but would suggest the appointment of a committee to consider this matter during the year and report to the Council at the next annual meeting.

On motion to adopt, the subject was laid upon the table for consideration at a succeeding meeting.

On motion, Dr. Koch was authorized to present the report of the Committee on Dental Legislation before the society.

On motion, adjourned.

FOURTH MEETING.

The Council met at 11:15 P. M., a quorum being present.

The minutes of the two previous meetings were read and approved.

On motion, the society is to be requested to appoint a Committee on Dental Legislation.

The following named persons were proposed for membership: Aigley, J. E., Farmington; Overholser, W. A, D. D. S., Milledgeville; Griffin, E. B., Chicago; Wilson, Orville W., D. D. S., Carrollton.

These names having been posted during one session, were voted on, and on motion, all were elected.

On motion, adjourned.

THIRD DAY, MAY 13—FIRST MEETING.

The Council met at 10 A. M., a quorum being present.

The resolution printed on page 261 was, on motion, completed by filling the blanks, so that the appropriation shall amount to $300.00. Adopted, and ordered presented before the meeting for action.

The resolution offered by Dr. Swain (see page 250) relating to the appointment of dentists in the army and navy of the United States was, on motion, adopted and ordered read before the society.

Springfield was selected as the next place of meeting.

The following appointments were made:

Dr. E. H. Allen, Freeport, Executive Committee.

Dr. A. W. Harlan, of Chicago, Committee on Dental Science and Literature.

Dr. J. E. Keefe, of Chicago, Committee on Dental Art and Invention.

Dr. Robert Goebel, member of the Board of Examiners.

Committee on the Infraction of the Code of Ethics: Drs. C. R. E. Koch, Chicago; D. E. Coulson, Galesburg, and W. E. Holland, Jerseyville.

Dr. E. K. Blair, Waverly, Supervisor of Clinics.

Local Committee of Arrangements: Grafton Munroe, G. H. Henderson and L. O. Frazee, all of Springfield.

The following officers were elected:

Secretary, A. H. Peck, Chicago; Treasurer, E. D. Swain, Chicago; Librarian, Grafton Munroe, Springfield.

Dr. Peck having been elected Secretary, tendered his resignation as a member of the Executive Council to take effect at the close of this meeting.

On motion, accepted.

On motion, Drs. Cushings and Peck were appointed to prepare a suitable membership application blank, for the use of the society in future years.

On motion, it was decided to publish the transactions in the future in the usual book form of past years.

The report of the Committee regarding publication of the transactions of 1897, consisting of Drs. Swain and Noyes appointed at a previous meeting, was on motion, referred to the Committee on Publication.

The bonds of the Secretary and Treasurer were then presented and on motion, approved.

The report of the Committee on medal and prizes was on motion, ordered read before the society, with the recommendation of the council as printed on page 262.

On motion, adjourned.

SECOND MEETING.

The council met at 5:30 P. M., a quorum being present.

The minutes of the two previous meetings were read and approved.

The following names having been posted during a session were then presented for membership: L. M. Williams, D. D. S., 144 Oakwood Boul'd., Chicago; F. R. McLean, D. D. S., Danville, Geo. T. Carpenter, M. D., D. D. S., 103 State Street, Chicago; C. W. Hodgman, D. D. S., Princeton, Ill.; E. H. Dillon, Elmwood.

On motion, all were elected.

The following communication was then read.

PEORIA, ILL., May 13, 1897.

We, the undersigned, hereby recommend J. H. Kennerly, D. D. S., Secretary of the Dental Department of Marion-Sims Medical College, of St. Louis, Mo., for corresponding membership, in view of services rendered by him to the dental profession in dental educational matters.

LOUIS OTTOFY,
TRUMAN W. BROPHY,
F. STANLEY EILES,
E. H. ALLEN,
C. N. JOHNSON,
R. N. LAWRENCE,
W. V-B. AMES,
W. H. TAGGART,
J. A. CURRY,
W. A. JOHNSTON.

Approved, { T. W. PRITCHETT, C. B. ROHLAND. } Board of Examiners.

On motion, Dr. J. H. Kennerly was elected to corresponding membership.

On motion, the Council appointed Drs. J. W. Wassall, of Chicago, A. H. Peck, of Chicago, and C. R. E. Koch, of Chicago, as the Committee on Medal and Prizes.

On motion, the following resolution was adopted:

WHEREAS, the efficiency of the State Board of Dental Examiners of Illinois is impaired by reason of the vacancies existing therein, therefore be it

Resolved, That the Illinois State Dental Society in 33d annual convention assembled in the city of Peoria, respectfully calls the attention of the Governor of Illinois to the necessity of filling these vacancies at the earliest practicable time.

On motion, the resolution was adopted, and the Secretary instructed to forward a copy of the same to the Governor of Illinois.

On motion, adjourned.

FOURTH DAY, MAY 14—FIRST MEETING.

The Council met at 8:30 A. M., a quorum being present.

The minutes of the previous meeting were read and approved.

On motion, the delinquent list was ordered read before the society.

There being no further business the minutes of the present meeting were read and approved, and on motion, the Executive Council adjourned *sine die*.

LOUIS OTTOFY,
Secretary.

The Illinois State Dental Society, in Annual Convention assembled, pauses in its deliberation to pay a merited tribute of respect to the memory of those who, during the past year, have been taken from its rolls and transferred to the throngs in the Great Beyond.

OBITUARY.

Three active, two honorary and one corresponding member have, since the last report, passed over the Grand Divide. Most of these have been for many years familiar, and all have been welcome figures at our meetings, and their absence will cause many a pang of regret among their old associates, for they have not been forgotten, either during the all absorbing labors of our sessions, or amid the pleasure of our social reunions.

This society as a mark of respect to the memory of its departed brethren, now rises, and listens with bowed head and reverent mien to the calling of the roll.

James Atwood Swasey, Chicago.

John W. Fisher, Bloomington.

John Hilton, Freeport.

William Newton Morrison, St. Louis, Mo.

Luman C. Ingersoll, Keokuk, Iowa.

E. Magitôt, Paris, France.

May the peace of God which passeth all understanding be theirs forevermore.

John W. Fisher.

Born October 2, 1829. Died February 11, 1897.

Dr. Fisher was born in Flushing, Belmont County, Ohio. A log cabin was his first home. His parents were natives of Virginia who went to Ohio soon after their marriage and engaged in farming. They prospered in their Ohio home and lived there until their death. In the family of nine boys and girls John W. was the second child. He received a fair education in the primary schools, remaining under the parental roof until he was twenty-one years of age. He then read medecine for one year, and commenced the study of dentistry a year later. His first practice was in his native town. Believing he could do better in St. Clairsville, the capital of Belmont County, he went there without money and with few friends. On his way he met an old Quaker friend who offered him $100.00, or any part of it. The young man took $50.00 of it at 8 per cent, and in six months after opening his office had paid the indebtedness in full. In St. Clairsville he practiced for eight years. Then, desiring to see something of the western country, he started for Illinois, and in 1869 settled in Bloomington, where he spent the rest of his life. For two years after arriving here he rested, but in 1871 took up his work as a dentist, and at that profession he remained with untiring energy to the very day on which he succumbed to the fatal stroke. On July 24, 1861, he was married to Miss Mary E. Clemens, who was born in Harrison County, Ohio. To this union were born two children, James E., and one daugher, Mary E. Dr. Fisher was a regular attendant upon the services of the Presbyterian church. He joined the Illinois State Dental Society in 1876, and his regular attendance at its meetings indicated his great interest in all its proceedings. His rugged, honest countenance was a familiar feature at its sessions. Modest, in the extreme, and of a most retiring and unassuming disposition, yet his sterling worth both as a dentist and as a man, was fully appreciated by all those who enjoyed his acquaintance. As one of his confreres who knew him intimately, well expressed it, "If there ever was a good, straightforward, honest man, and an able conscientious dentist, Dr. Fisher was one." His associates regarded him with the highest respect, and hold him in affectionate remembrance.

John Hilton.

Born April 7, 1848. Died November 4, 1896.

The subject of this sketch was born in Ontario, Canada, from whence he was taken in early boyhood by his parents to Liberty, Michigan, where he grew to manhood, receiving such instruction as the common schools of the community afforded. When he was prepared for it he entered the State Agricultural College at Lansing, and after completing the course of study there, he entered the Theological School at Canton, New York, in the autumn of 1871. After completing the entire three years' course of study, he followed this up with the full post-graduate course, and in due time received the degree of Ph. D. After leaving the school, he entered the ministry of the Universalist church. His first pastorate was at Windsor, Vermont, from whence after a very successful career, he removed to Hinsdale, New Hampshire. Here the development of a serious lung trouble drove him from the pulpit, and long silenced his voice in public speaking. Under the physician's orders he spent several months in Florida, but although much relieved, it became evident to him that his career as a minister was ended, and he then prepared himself for the profession of dentistry. He came west and located at Fort Atkinson, Wisconsin, where notwithstanding his physician's prohibition, he again assumed pastoral duties, and for several years filled the pulpit on Sunday, and practiced dentistry during the week, thus doing double duty, for the sake of the good he might do. It was in Fort Atkinson that Dr. Hilton married Dr. Jennie Kollock, who had just graduated from the dental department of the University of Michigan, and together opened a dental office. In 1892 Dr. and Mrs. Hilton removed from Fort Atkinson to Freeport, Illinois, where they entered upon the practice of dentistry, and where the doctor remained until the time of his death, November 4, 1896. Mrs. Hilton and two brothers survive him.

Dr. Hilton was a member of the Masonic and Knights of the Pythias orders. He was also a member of the Northern Illinois Dental Society. He became a member of this society in 1893 Dr. Hilton, through his previous training, his mental qualifications, his upright and truthful life, his faithfulness to the voice of duty, gave promise of becoming a most useful and valuable member. The lingering weakness of throat and lungs, however, did much to hinder his attendance, and finally closed his career as a member forever.

A graceful tribute to the memory of Dr. Hilton, from which we glean much of the foregoing, appeared shortly after his death in *The Universalist*, and gave unmistakable evidence of the high esteem in which he was held by his church associates.

The members of the society extend to his sorrowing family their deepest sympathy.

James Atwood Swasey.

Born March 12, 1833, died December 24, 1896. Dr. Swasey was born in North Danville, Caledonia Co., Vt., where the foundations of his education were laid in the district schools. Subsequently he was a student for two years at Phillips' Academy, Danville, and later determined upon following the profession of dentistry. In the office of O. S. Swasey, M. D., of Beverly, Mass., the doctor first began his studies in dental surgery. Afterward Dr. Swasey practiced five years in Ipswich, Mass., four years in Gloucester, Mass., and in 1869 moved to Chicago, where he practiced his profession almost continuously to the date of his death. In May, 1862, he was married to Miss Tuck, of Beverly, Mass., who survives him. Early in 1892 he lost his only son, a young man of much promise and a recent graduate of the Chicago College of Dental Surgery. From that date he never recovered his usual vivacity of spirits and seemed to have lost much of his interest in his practice and professional application. He however apparently retained his usual good health up to about the middle of November, when he first noticed that he was suddenly breaking down, and for a few days went to the West Baden Springs. Not finding the desired relief he returned to his summer home in Michigan, and from there came to Chicago, where he died surrounded by his family and friends.

Dr. Swasey occupied a high place in his profession. He was the first President of the Chicago College of Dental Surgery, and was reëlected for several years. He was President of the Chicago Dental Society, also President of the Odontological Society, of Chicago, in 1894-5; a member of the American Dental Association, and also of the first International Dental Congress, Paris, France, in 1889. He was also an honorary member of several other dental societies. He joined this society in 1876. Dr. Swasey was an inventor and contributed a number of useful appliances to his profession.

The society loses in the death of Dr. Swasey one of its best, most generous and high minded members.

Dr. Luman C. Ingersoll.

Born September 26, 1823. Died May 24, 1897.

Doctor Ingersoll, one of the leading members of the dental profession in the Mississippi Valley, and an honorary member of this society since 1873, died at his home in Keokuk, Iowa, May 24. He had been ill for a number of months, but a few days before the above date, suffered a stroke of paralysis, which was the direct cause of his death. At his advanced age but little hope of his recovery was entertained, and although not unexpected, the notice of his demise, comes with a shock to the profession of which he was so long an honored member.

Dr. Ingersoll was born in Ogden, Monroe Co., New York. He was the son of Theodore S. and Lydia (Brewer) Ingersoll, who were natives of Massachusetts. His father, after engaging at different times in mercantile and agricultural pursuits, emigrated to Oberlin, Ohio, and was one of the founders of Oberlin College. For the establishment of this he gave liberally of his means, but during the crisis of 1837, he lost the greater part of his property; thus throwing young Luman on his own resources. Dr. Ingersoll, being of a naturally studious disposition, notwithstanding his reverses in his fortune, pursued his education with eagerness, and after a preliminary course of study, entered Oberlin College, from which he graduated in 1846. After engaging a few years in educational pursuits, he entered the dental office of his brother in Oberlin, where he remained until 1853, when he removed to Cleveland, and after six months' employment with a firm of that city, engaged in business for himself. After five years' practice he sold out and went to Keokuk, Iowa, where he engaged in practice, study and teaching until his last illness. In 1850 he was married to Miss Maria Porter, who died in 1888. In June 1890 he was married to Miss Minnie Banks, of Keokuk, who, together with his sister and two brothers survive him. Dr. Ingersoll received the degree of Master of Arts from Oberlin College in 1860. In 1882 he was elected dean of the dental department of the State University of Iowa, which position he held for almost ten years. He was closely identified with college work for nearly twenty-five years. After the organization of the Keokuk Medical College, he became a member of the faculty, his last term of lectures being delivered during the winter of 1895–96. His last public appearance was at the commencement exercises of this college last March, when he delivered the commencement address. Dr. Ingersoll was not only highly educated in his chosen profession, but was a student of a wide range of subjects, and possessed literary attainments of more than an ordinary degree. For two years he was president of the Keokuk Library Association. Dr. Ingersoll stood high as a writer and speaker. As an author he is best known by his treatise on dental science, which was adopted by a number of schools as a text-book. His essays, of which he contributed a number to this society, will be remembered for their literary excellence as well as their scientific value. As a speaker he was forcible and polished. His manners were genial, kind and dignified.

His death removes from a sphere of usefulness a man of great attributes of heart and mind. His city loses a good citizen, his profession a shining light.

We are indebted to *The Gate City* for much of the foregoing.

William Newton Morrison.

Born May 25, 1842. Died December 20, 1896.

What a host of memories will rise up in the minds of most of the members of this society at this simple announcement. The name of Dr. Morrison is indisolubly linked with the records of the Illinois State Dental Society for over a quarter of a century.

In 1871 in its early infancy, he was elected an honorary member. Never was this honor more worthily bestowed, never more richly repaid, for few, if any, of her active members were more constant in their attendance or contributed more to the interest and value of her meetings. From a mind richly stored with practicable and valuable ideas, he freely gave to all. His geniality and unselfishness called forth the affectionate regard of all with whom he came in contact, and not one of our visiting brethren was ever looked for with more interest or received with a heartier welcome than Dr. Morrison. Alas, that a mind so bright and active, a nature so genial and gentle, so kind and charitable should be cut off in the very zenith of its usefulness. Truly there went from among us on that fateful December day a gentleman in every sense of the word.

From the proceedings of a special meeting of the St. Louis Dental Society, held December 22, 1896, and called for the purpose of taking action upon the death of Dr. Morrison the following data are taken:

Dr. Morrison was born at East Springfield, Ohio. His early education was obtained in the common schools. In 1858 he went to St. Louis to become a student of his brother, James B., the inventor of the Morrison dental engine and chair. In 1864 he graduated from the Ohio College of Dental Surgery. In 1868 he married Miss Cornelia Holme, of Hannibal, Mo. Two sons, Peter Holme and William N., were the result of this union.

Dr. Morrison kept abreast of the advance of his profession, and was one of the first to use the mallet and to construct gold crowns. He was one of the first to revive the "planting" of teeth, as he called it, his first cases being reported in 1874; the last report was made at the last meeting of the St. Louis Dental Society that he attended, on December 1, 1896. He cheerfully gave to others ideas which he thought might interest or benefit them, and always took pleasure in entertaining dentists who visited him. He became a Mason in 1865. He was brought up a Methodist, but after marrying, joined the Presbyterian church. He was a constant attendant of dental societies, and held membership in the American, Southern, Missouri State, Illinois State, St. Louis and others societies, frequently writing papers, giving clinics, and joining in the discussions. He was at one time president of the Missouri and twice president of the St. Louie Society. He took an active part in the Missouri Dental College, filling the chair of mechanical dentistry, also acting as demonstrator, and gave clinics every session when in the city. Dr. Morrison traveled extensively. In July, 1878, he started on a trip around the world which consumed about a year. While on this trip he studied the status of the profession in the countries visited, bringing home

with him specimens of work found while abroad. In 1890 he took a trip to Germany for his health; again, in 1894, accompanied by his wife, he made a trip to Europe. He had been to the West Indies and also traveled extensively in this country. Dr. Morrison was a frequent writer for dental journals. Many of his articles and items are to be found in the *Missouri Dental Journal*, and its successor, the *Archives of Dentistry*, both of which he aided in many ways. Of the former, he was one of the editors of the department of mechanical dentistry for four years.

Dr. Morrison was well known and esteemed in this country and abroad. He was the inventor of the dental bracket, which was one of the first on the market. His success was gained by hard, faithful work, and he was ever ready to lend a helping hand to his fellow-man.

Dr. E. Magitot.

Magitôt was born in Paris in 1833, and died there during the current year. His first contribution to dental literature was made in 1857 at the age of twenty-four, relating to the structure and development of the human teeth, while the last came from his pen in 1897, just before he died. During these forty years Magitot wrote no less than sixty-five books, essays, pamphlets, etc., dealing exclusively with nearly every phase of dental embryology, histology, biology, pathology, hygiene, etc. No writer of any age has made as many, as varied and as valuable contributions to dental science as has Magitôt.

The priceless services rendered by him entitle him to rank as one of the foremost investigators of odontology. He was a member of numerous scientific bodies and societies, whose members sincerely mourn his loss. It may be truly said that when Magitôt passed from the scenes of human activity, dental science, not of France alone, but of the entire world, lost one of its noblest and greatest minds.

The dental prefession of the United States, recognizing and appreciating Magitôt's services, keenly mourns and sympathizes with his bereaved family and the profession of France by reason of his demise.*

A. W. Harlan,
J. W. Wassall,
Louis Ottofy. } *Committee.*

*[These resolutions were adopted by the Odontological Society of Chicago and published in all dental journals of the United States. Sec.]

Thos. W. Reed, Macon, Mo.

Dr. Thos. W. Reed, of Macon, Mo., a corresponding member of the Illinois State Dental Society since 1883, died November 14, 1896.

Louis Ottofy,
Secretary.

November 21, 1897.

Remarks on the Report of the Committee on Necrology.

Dr. C. B. Rohland: During the last year the Illinois State Dental Society has lost by death three active and two corresponding members. All of these have been for many years familiar and welcome figures at our meetings, and their absence causes many a pang of regret among their old associates. They have not been forgotten, however, during the all-absorbing labors of our sessions. Your committee desire to make an informal report at this time, bnt will make a full report later in time to have it appear in the printed transactions. As a mark of respect to the memory of our departed friends, let the members rise during the reading of their names: Dr. J. W. Fisher, Bloomington; Dr. John Hilton, Freeport; Dr. J. A. Swasey, Chicago; Dr. Wm. N. Morrison, St. Louis and Dr. C. W. Spalding, River Point, R. I.

Dr. R. N. Lawrance, Lincoln: *Mr. President:* I desire to pay my tribute of respect to the memory of deceased friends, not only of our own household, but outside our limits. During the past few months death has thinned the ranks of the profession and taken from this country some of our brightest lights. Two were personal friends, class-mates and roommates. I refer to Heitzman, Peabody, Morrison and Abbott, names that are honored and revered throughout the length and breadth of this land. But there is one of our own number, a personal friend, to whose memory I will pay a tribute of respect. The annals of dentistry bear the names of but few who were more useful and honored in their professional lives than Dr. James Atwood Swasey. Memory alone can bring back to us the hearty grasp of his hand, the genial presence of our brother; loved by all who enjoyed the pleasure of his aquaintance, a friend to all who desired the friendship of a noble man of more than average ability, he brought to his work a high degree of intelligence, worthy of the distinguished honor he won while living and of most tender and regretful memories now that he is dead. Peace to his ashes. Rest to his soul.

Dr. C. S. Case: I would like to say a word or two in regard to our friend, Dr. Swasey. I was not as intimate with him as many of the Chicago members, but I was intimate enough to know that he had a wonderful force and power. He was an upright, genial and lovable man. There was no hypocrisy about him. It was my fortune to have the opportunity to take an impression of his face and make a bas relief cast, which I presented at one time to the Odontographic Society. Some of the men there who knew this man, who loved him as they loved a brother, were so overcome by the exhibition that they could hardly speak. I wish it were possible to perpetuate the memories of all of the men who are now growing old and are prominent in the profession in a similar way. With the help of Dr. Hunt, I was able to take a very good impression of our friend, Dr. McKellops, while he was in Chicago a short time ago, and at some future time I hope to present a bust of this wonderful man to the dental profession.

Dr. Truman W. Brophy: I would scarcely do justice to my feelings if I permitted this opportunity to pass without saying a word in regard to the life and work of a man with whom I became very intimate many years ago and whose straightforward course and relations with men distinguished him. Every one who knew Dr. Swasey knew that there was nothing ambiguous in his utterances; they always knew where Dr. Swasey stood If he had anything to say about a man

he said it to the man himself. If he was placed in a position of trust, his work was always done squarely and honestly and openly. He never resorted to intrigue, to anything that would be in the slightest degree criticised. He was a man that everybody loved because of the honesty of his efforts. Dr. Swasey was a man skilled in his profession, a man capable of performing any operation known to modern dentistry, and whatever he knew, whatever he did, was open to all and given to the profession with pleasure. He received members of his profession in his own office and spent his time and energy in showing them what he believed were improvements in the science and art of dentistry.

As I think over the years that have gone by and of those members of the society who were active in its work when I became a member, I think that the years will not be many until many of us will have passed over to the silent majority, and as I have witnessed the proceedings of this meeting, I am satisfied that the work which has been done and honestly done by the older members will be taken up and handled with a master hand by the young men who have distinguished themselves at this meeting.

To the memory of Dr. Swasey, I wish to say that those who knew him best and who knew his characteristics, loved him most; if a fellow practitioner failed to perform an operation with a high degree of skill, Dr. Swasey was not the man to criticise him. He would speak of such a man with a charitable feeling. He was ever ready to extend a helping hand.

I am glad that this spirit has prompted the members of this society from its earliest infancy to pay their tributes of respect to deceased friends, particularly when we know that our society has attained a high standing not only in this country but abroad.

Dr. C. R. Taylor: Dr. Swasey was a man who would impress any one, and I am glad to hear the members who knew him intimately speak of him as they have. But we had also in this society up to within a short time another member very much the opposite in many respects from Dr. Swasey, and yet having many noble, sterling and beautiful qualities and characteristics. I refer to Dr. Fisher of Bloomington. He was retiring in disposition, and yet he was a man who had a great deal of ability, a great deal of nobility of character and of gentleness of spirit.

Then, too, there is Dr. Morrison, I knew him very well. Everything he did for the profession was cheerfully done. I cannot say that I was as intimate with him as some of the members, yet I have known him for twenty-three or twenty-four years. I think I first met him in St. Louis. He was nearly always present at our meetings. He never charged anything for any information, but gave it freely. He was one of the leaders in the line of thought and invention. But how much better it would be if we could and would say these things before our friends leave us.

Dr. F. H. McIntosh, Bloomington: It may seem strange to some of the members, when there are several of us present from Bloomington, that we have had nothing to say regarding our dear friend Dr. Fisher. I am not in the habit of making public addresses or delivering eulogies on the dead, and I cannot in any words of my own speak of the true merits of Dr. Fisher. I shall only attempt a few utterances. He was a friend of every one of his dental brethren of our city. Ever ready to extend a helping hand, and above all, he was a very progressive

man. Not many months before his death he declared to me, and I think honestly, "I never have attempted to do better work than the work I am doing to-day." I believe he was correct. He was thoroughly honest in every undertaking, and we shall miss him very much in our society.

Dr. E. H. ALLEN, Freeport : I feel that I ought not to allow the opportunity to pass without saying a word in regard to one of our deceased members—Dr. Hilton, of Freeport. Dr. Hilton joined the society at its last meeting held in Rock Island. He was a quiet, unassuming, modest man, and for that reason perhaps not many members of the society became acquainted with him. But I have this to say about Dr. Hilton, without any qualifications whatever, he was a good man, a kindly man. I know of a number of cases where he made it a special effort to call on others who were sick and talked with them and cheered them up. As a dentist, he was a man of considerable ability; he was honest and fair in his dealings with his professional brethren, and I cannot but feel that it was a pleasure to know such a man. I am sorry that I was not better acquainted with him; but what I have said I feel that I can say truthfully.

Dr. EDMUND NOYES : I want to indulge in a word or two before I begin the discussion on Dr. Templeton's paper. If any of you have had the good fortune, as I have, to see any of Dr. Fisher's patients, you will have realized that his operations were of the very highest order of excellence. Some of you may not have seen enough of him here in the meetings to take his measure, but he was a kind man and an unusually skillful operator.

IN MEMORIAM.

Austin, J. F.
Baker, D. B.
Bushong, E. W.
Call, E. B.
Davis, E. F.
Dean, M. S.
Eames, W. H.
Fisher, J. W.
Fitch, H. H.
Forbes, Isaiah.
George, Isaac.
Hand, M. F.
Harrington, G. H.
Hawxhurst, D. C.
Hendel, J. W.
Henry, Charles.
Hilton, John.
Ingersoll, L. C.
Judd, Homer.
Keely, George W.
Kulp, W. O.
Lewis, C. W.
Lewis, H. N.
Magitot, E.
Morrison, A. M.
Morrison, W. N.
Park, Edgar.
Patrick, J. J. R.
Reed, Thos. W.
Reynolds, J. S.
Rivers, C. W.
Sawyer, Charles K.
Sillimann, H. H.
Smith, H. J.
Spalding, C. W.
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